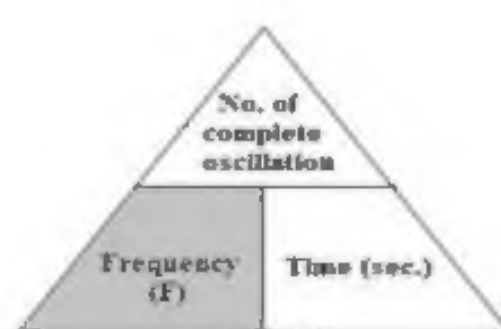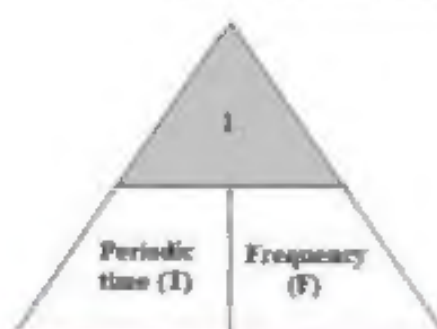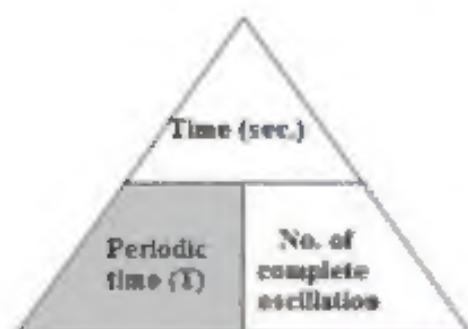# Important laws

$$\text{Periodic time (T)} = \frac{\text{Time (Seconds)}}{\text{Number of complete oscillations}} \quad \text{I}$$

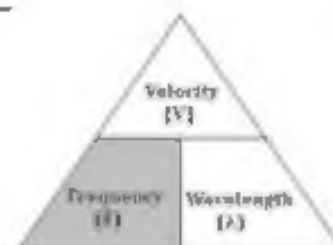$$\text{Frequency (F)} = \frac{\text{Number of complete oscillations}}{\text{Time (Seconds)}} \quad \text{II}$$

Time (sec.)
Periodic time (T) | No. of complete oscillation

1
Periodic time (T) | Frequency (F)

No. of complete oscillation
Frequency (F) | Time (sec.)

Frequency × periodic time = 1

= 1 x 10^3 Hertz **Kilohertz**	10^{-3} meter .x= 1 **Millimeter (mm)**
= 1 x 10^6 Hertz **Megahertz**	10^{-6} meter.x= 1 **Micrometer**
= 1 x 10^9 Hertz **Gigahertz**	10^{-9} meter.x= 1 **Nanometer**

velocity (V)
Meter/second = Frequency (F) Hertz × Wavelength (λ) Meter

Velocity [V]
Frequency [f] | Wavelength [λ]

$$\text{Sound frequency (F)} = \frac{\text{Number of cycles (turns) (d)}}{\text{Time in seconds (t)}} \times \text{Number of gear's teeth (n)}$$

The two laws of sounds (light) reflection

<u>1st law:</u> The angle of incidence = The angle of reflection.

<u>2nd law:</u> The incident sound (light) ray, the reflected sound (light) ray, and the normal to the reflecting surface at the point of incidence, all lie in one plane perpendicular to the reflecting surface\

2) Write scientific term for the following:

1. Short stem where the leaves are developed and modified into reproductive organs. (*Flower*)

2. The outer whorl of floral leaves which consists of a group of green sepals.   (*Calyx*)

3. A flower that contains androecium and gynoecium.   (*Hermaphrodite - Bisexual*)

4. Leaves of floral whorl that consists of fine filament ending by a sac. (*Stamens*)

5. It is the pollination carried out by man.   (*Artificial pollination*)

6. A hormone produced by the testis. *(Testosterone)*

7. A floral whorl in the flower, its function is to attract insects. *(Corolla)*

8. A sac-like structure that regulates and keeps the temperature of testis 2 degrees below the normal body temperature. *(Scrotal sac - Scrotum)*

9. The cell resulting from the fusion of pollen grains and ovum nucleus. *(Zygote)*

10. The transfer of pollen grains from the anthers of a flower to the stigma of another flower on another plant. *(Mixed pollination)*

11. The fusion of the male cell (pollen grain) with female cell (ovum). *(Fertilization)*

12. The female reproductive organ in flower. *(Gynoecium)*

13. A flower that contains androecium only. *(Male flower)*

14. A group of glands their function is to secrete semen. *(Genital associated glands)*

15. The reproduction of some plants by parts of the roots, stem or leaves. *(Cutting)*

16. A new method of producing large numbers of plants from a small part of it. *(Tissue culture)*

17. The process of multiplying a small part of plant to get many identical parts. *(Tissue culture)*

18. A tube with funnel shaped opening transports the ovum to the uterus. *(The fallopian tube)*

19. The genetic material which carries genes those are responsible for the hereditary traits of the organisms. *(Chromosomes)*

20. A cell, which its nucleus contain 23 pairs of chromosomes resulting from the fusion of sperm and ovum. *(Zygote)*

21. The changing of light ray path when moving from a transparent medium to another transparent medium. *(Light refraction)*

22. They are sound waves of frequency less than 20 Hz. *(Infrasonic waves)*

23. The distance covered by light in one second. *(Speed of light)*

24. A property by which the ear can distinguish between sharp and rough sounds. *(Sound pitch)*

25. A property by which the ear can distinguish between strong and weak sounds. *(Sound intensity)*

26. The ability of the medium to refract light. *(Optical density)*

28. It is an external factor that affects the ear causing the sense of hearing. *(Sound)*

29. They are tones that accompany the fundamental tone, but they are lower in frequency and higher in pitch. *(Harmonic tones)*

30. A type of reflection takes place on a dirty plan mirror. *(Irregular reflection)*

31. The angle of incidence = the angle of reflection. *(First law of light reflection)*

32. An angle between the refracted light ray and the normal at the point of incidence at the interface. *(Angle of refraction)*

33. The sound intensity is inversely proportional to square of the distance between the surface and sound source. *(Sound inverse square law)*

34. The angle between the refracted light ray and the normal at the incidence point. *(Refraction angle)*

35. The reciprocal of the frequency. *(Periodic time)*

36. The maximum displacement done by the oscillating body away from its original position. *(Amplitude)*

37. The number of complete oscillations produced by the oscillating body in one second. *(Frequency)*

38. The time taken by the oscillating body to make one complete oscillation. *(Periodic time)*

39. The direction through which the wave propagates. *(The line of wave propagation)*

40. The motion which is regularly repeated in equal periods of time. *(Periodic motion)*

41. The motion of the oscillating body around its rest position. *(Oscillatory motion)*

42. The area in the longitudinal wave at which the medium particles are away from each other. *(Rarefaction)*

43. The highest point in the transverse wave. *(Crest)*

5) What is meant by?

1. **Pollination in flowers** *It is the transfer of pollen grains from flower anthers to stigma.*

2. **Self-pollination** *It is the transfer of pollen grains from the anthers of a flower to the stigmas of the same flower.*

3. **Cross (Mixed) pollination in plants**
It is the transfer of pollen grains from the anthers of a flower to the stigmas of another flower in other plant of the same kind.

4. **Artificial pollination** *It is the type of pollination carried out by man like cutting, grafting, layering and tissue culture.*

5. **Fertilization in flower** *It is the fusion of the nucleus of male cell (pollen grain) with the nucleus of female cell (ovum) to form the zygote.*

6. **Zygote** *t is the cell resulting from the fusion of the nucleus of male cell (pollen grain) with the nucleus of female cell (ovum).*

7. **Hermaphrodite flower** *It is the flower which contains male reproductive organ (androecium) and female reproductive organ (gynoecium).*

8. **Tissue culture** It is the process of multiplying a small part of a plant to get many identical parts.

9. **Sound pitch** It is the property by which the human ear can distinguish between sharp and rough sounds.

10. **Sound intensity** It is the property by which the human ear can distinguish between strong and weak sounds.

11. **Sonic waves** They are sound waves of frequencies ranges from 20 Hz: 20 KHz and can be heard by human ear.

12. **The absolute refractive index of water is 1.33** It means that the ratio between the speeds of light in air to the speed of light through water equals 1.33.

14. **Angle of emergence:** It is the angle between the emergent light ray and the normal at the point of emergence on the interface.

15. **Light reflection** It is the rebounding of the light rays in the same medium on meeting a reflecting surface.

16. **Light refraction** It is the change of light path when it travels from a transparent medium to another transparent medium of different optical density.

17. **Optical density** It is the ability of the transparent medium to refract light.

18. **The oscillatory motion** It is the motion of the oscillating body around its rest point, where the motion is repeated through equal time intervals.

19. **The wave :** It is the disturbance that propagates and transfer energy in the direction of propagation.

20. **The oscillating body makes 200 oscillations in 2 minutes**
It means that the frequency of the oscillating body = 1.6 Hz.

21. **The wavelength of a sound wave is 30 cm**
It means that the distance between the centers of two successive compressions or refractions = 30 cm.

6) What happens when?

1. **Pollen grain falls on the stigma of a flower.** It will germinate forming a pollen tube.

2. **If there is no seminal fluid in male.**
The sperm will die during passing through urethra.

3. **The middle part (mid-piece) of a sperm is damaged.**
The sperm will not have energy, so it will cannot move or attack the ovum.

4

4. Ovaries of the human female are not secreting the progesterone hormone.

No pregnancy will occur.

5. The stigma of a flower doesn't secrete sugary solution after pollination process.

The pollen grain will not stick on stigma, and then pollen grain will not germinate.

6. Incidence of light rays on a rough surface.

The light rays are reflected in different directions (irregular reflection).

7. The sound wave travels from solid to water (concerning its velocity)

Sound velocity will decrease, since velocity of sound through solids is higher than the velocity of sound through liquids.

8. The wave length increases to the double value when the wave velocity is constant (concerning the frequency).

The frequency will decrease to half since $(V = F \times \Lambda)$.

9. A light ray falls perpendicular on a reflecting surface.

The light ray will reflect on itself.

10. Light rays falls perpendicular to the interface between different transparent media of different optical densities. The light ray will pass without any refraction.

11. The distance between the sound source and the ear becomes double (concerning the sound intensity). The sound intensity will decrease to its quarter.

12. The oscillating body passes its rest position during its movement (concerning its velocity) The velocity will increase to its maximum.

13. The oscillating body reaches the position of its maximum displacement during its movement (concerning its kinetic energy).

The kinetic energy = zero because the velocity at the maximum displacement =zero $(K.E = \frac{1}{2} m \times v^2)$.

14. A light ray travels from a more optically dense medium like glass to less optically dense as air.

The light ray will refract away from the normal.

7) Give reason for the following:

1. The petal of corolla is colorful and scented?

To attract insects which help in reproduction process.

2. The fallopian tubes are lined with cilia?

To direct the ripe ovum towards the uterus.

3. The presence of the testis in human male outside the body in the scrotal sac?

To keep the temperature of the two testis two degrees below the normal body temperature

4. Palm flowers are unisexual? Because it contains male reproductive organ only (androecium only) or contain only female reproductive organ (gynoecium only).

5. Flowers pollinated by insects produce coarse pollen grains?
To stick on the insect body.

6. Hearing thunder after seeing lightning although they both happen at the same time?
Because the sound of thunder (mechanical wave) faster than the lightning(electromagnetic wave.

7. Auto pollination happens in barley plant, while can't happen in sunflowers?
Because in barley plant, the anthers and stigmas are maturated at the same time, while in sunflowers the anthers and stigmas are not maturated at the same time.

8. The sperm has a long and a thin tail? To make easy movement to reache ovum.

9. The uterus is lined with mucus membrane rich in blood capillaries (Placenta)?
It is responsible for the nourishment of fetus (through umbilical cord) during pregnancy.

10. The uterus is a suitable organ for the growth of embryo?
Because it has thick muscular wall that is rich in blood capillaries to feed the embryo and supply it with oxygen and also protect the embryo until birth.

11. Peach fruit contains only one seed? Because the ovary of the peach contains only one ovule, so it contains only one seed.

12. The seminal fluid is alkaline? To neutralize the acidity of urethra, so the sperms don't die during passing through urethra

13. When a light ray is incident perpendicular to a reflecting surface, it reflects on itself?
Because the incidence angle = reflection angle = zero.

15. We can't hear the sound of solar explosions, while we can see the light coming out of it? Because the sound of solar explosions is a mechanical wave which need a medium to propagate , while light is electromagnetic wave which can propagate through vacuum.

16. Sound of man harsh, while sound of woman sharp? Because the sound of man has low frequency (low pitched) and the sound of woman has high frequency (highly pitched).

17. Sound travelling in air has less intensity than travelling in carbon dioxide?
Because the density of carbon dioxide is higher than that of air, and the sound velocity increases by increasing density of the medium.

18. The absolute refractive index for any transparent media is larger than 1?
Because the speed of light through air is larger than the speed of light in any other transparent medium.

19. The use of ultrasonic waves in milk sterilization?
Because it has the ability to kill bacteria and stop the action of some viruses.

20. The motion of rotary bee is considered as a periodic motion, but is not considered as an oscillatory motion?

Because its motion is not repeated on the two sides of its rest position.

21. The motion of a spring is an oscillatory motion?

Because its motion is around its rest point through equal time intervals.

Mention one use or function for the following:

1. **Calyx:** Protects the inner parts of flower especially before blooming.

2. **Epididymis:** Stores the sperm.

3. **Gynoecium:** Produces ovules.

4. **The corolla**: Protects the reproductive organ of flower.

5. **Anthers of flowers**: Produces and holds pollen grains.

6. **Ovary in female human**: Production of female sex hormone (estrogen and progesterone) and production of ovum.

7. **Fallopian tubes**: Receive the ripe ovum and direct it to the uterus.

8. **Testis:** Production of male sex hormone (testosterone) and production of sperms.

9. **The scrotal sac**: It keeps the temperature of the two testis two degrees below the normal body temperature which is suitable for growth and development of sperms.

10. **Head of sperm**: Contain one half of the genetic material.

11. **Midi-piece of sperm**: It contains mitochondria which responsible for the Production of the energy needed for the sperm movement.

12. **Testosterone hormone:** Appearance of male secondary sex characters in male.

13. **Estrogen hormone**: Appearance of secondary sex characters in female.

14. **Progesterone hormone**: Responsible for the occurrence and continuity of pregnancy.

15. **Prostate, seminal vesicles and Cowper's glands** (Genital associated glands): Secrete a seminal fluid which nourishes the sperm, facilitate the flow of sperms and neutralize the acidity of urethra.

16. **Ultrasonic waves**: Sterilization of water, food and milk - breaking down of kidney and ureter stones and discovering landmines.

17. **Jacuzzi** (physiotherapy tubes):

Used to treat sprains and cramps by using hot water - nervous tension by using cold water.

Oscillatory motion

1. Complete:

1-The kinetic energy of the oscillating body reaches its........................Value, when it passes its original position

2-The time of one........ Is known as periodic time and its measuring unit is ....

3-If the maximum displacement done by the oscillating body away from its original position is 0.2 cm which is made in 0.5 second, so its
amplitude is....................and the periodic time is..........................

4-If the periodic time of an oscillating body is 0.2 seconds, so the time taken to do 5 complete oscillations is..........................

5-The motion of rotary bee is not considered as a....................motion although it is a ....motion

6-Oscillatory motion is an example of......................motion

7-The kinetic energy of the oscillating body reaches its .... Value when it passes its original position

8-The movement of...................and..................are examples of oscillatory motion

Give reasons:

1-The product of frequency and periodic time equals unity

....

2-The velocity of the body is taken as a measure of its kinetic energy

....

3-The motion of spring is considered as an oscillatory motion

....

4-The motion of the rotary bee is a periodic motion

....

Put (√) or (x) and correct the wrong ones:

1-The simple harmonic motion is a form of oscillatory motion ( )

2-A vibrating body makes 1/4 complete vibration in 1/64 sec, its frequency is 6 Hz ( )

3-The velocity of the oscillating body reaches its maximum value at the position of maximum displacement during its movement ( )

4-Due to the oscillatory motion of water molecules, heat energy is produced ( )

5-Hertz is a measuring unit of periodic time ( )

Mention the mathematical relation between:

1-Frequency and periodic time...

2-Amplitude and complete oscillation of an oscillatory body

Problem:

Calculate the number of complete oscillations that are made by a body in 2 minutes if its frequency is 6 Hz

....
....

waves

Complete:

1-Radio waves are considered ……………………..waves that propagate through free space with a velocity of………………

2-The molecules of the medium…………………during the passing of waves in the direction of wave propagation without………………from their rest positions

3-Rarefaction is the area of the medium at which the medium particles are of……….density and…………..

4-The longitudinal waves consists of………………..and…………………..

5-…………..waves need a medium to propagate through, such as………………and…………..

6-………………is the area of medium at which the medium particles are of the highest density and pressure

7-Waves are classified according to the direction of vibration of medium particles relative to the direction of propagation into………...and……………..waves.

8-The wave is a………………which transfers………….along its direction of propagation.

Write the scientific term:

1-The relationship between the frequency and the wavelength in the wave motion (……….)

2-The measuring unit of wave velocity (…………………)

3-The distance between two successive crests or troughs (……………..)

4-The wave which don't need a medium to propagate (…………………)

5-A disturbance that propagates and transfers energy along the direction of propagation ……)

6-The maximum displacement of the medium particles away from their original positions ….)

7-Wave in which the particles of the medium vibrate perpendicular to the direction of propagation without transferring from their positions(…………………..)

8-The time which is required by the source to make one wave(……………………)

Put (√) or (x) and correct the wrong ones:

1-Sound waves are transverse waves, which propagate through media in the form of compressions and rarefactions ( )

2-The sound velocity through liquids is more than that through gases( )

3-Water waves are mechanical waves because they propagate through vacuum ( )

4-Wave velocity = wave frequency × number of waves in one second( )

5-Amplitude of a wave is the time taken for one wave ( )

6-The crest is the maximum displacement of the particles of the medium upwards ( )

7-Water and light waves are examples of transverse waves ( )

8-In wave motion, medium particles move from their places carrying the energy ( )

9-In the longitudinal wave, the particles of the medium vibrate in a direction perpendicular to the direction of wave propagation ( )

Give reasons:

1-Sound waves are longitudinal mechanical waves

....

2-The frequency of the vibrating body decreases with the increase of its periodic time

....

3-The flame of a candle vibrates forward and backward if we put the candle in front of a loudspeaker

....

4-Wave motion is considered as a periodic motion

....

5-We see lightning before hearing thunder

....

Calculate:

1- Wavelength (   )

2- Frequency (   )

3- Amplitude (A)

4- Wave velocity (V)

5- periodic time
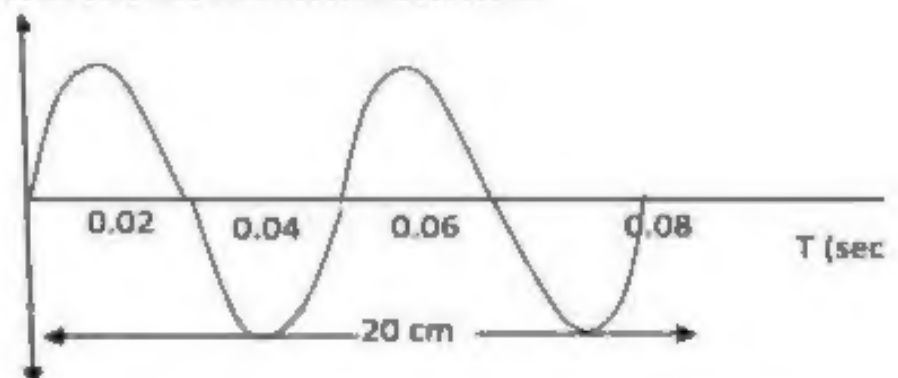
In the opposite figure: when the ball on the pendulum

moves form (x) to (y) in a duration of 0.02 seconds, the frequency equals

..............Hertz   (0.04 – 0.02 – 25 – 50)
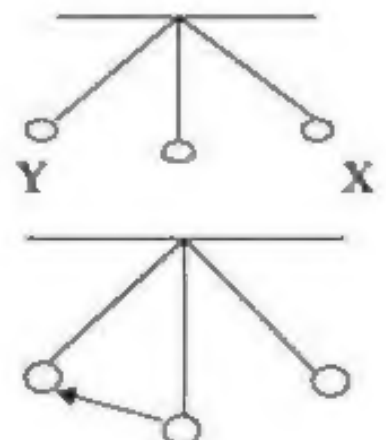
In the opposite figure, the pendulum takes 0.4 sec to make

2 complete oscillation, calculate :

Amplitude

Periodic time

Frequency

10. From the opposite, calculate:

a. wavelength

b. Frequency

c. Amplitude
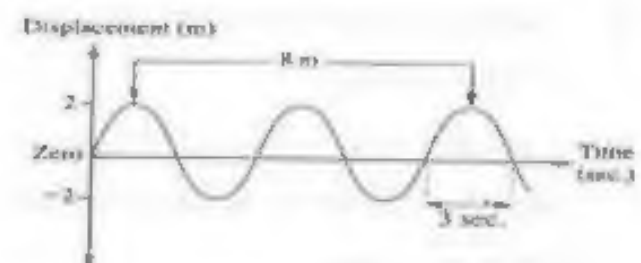
d. Wave velocity

From the opposite figure, *complete the following statements:*

1. The points A & B represent ......&.........

2. The amplitude =......... ....cm.

and the wavelength = ...cm.

3. The periodic time =............... sec.

while the frequency =............... Hz.

4. Wave velocity = ... x .... m/sec,

10
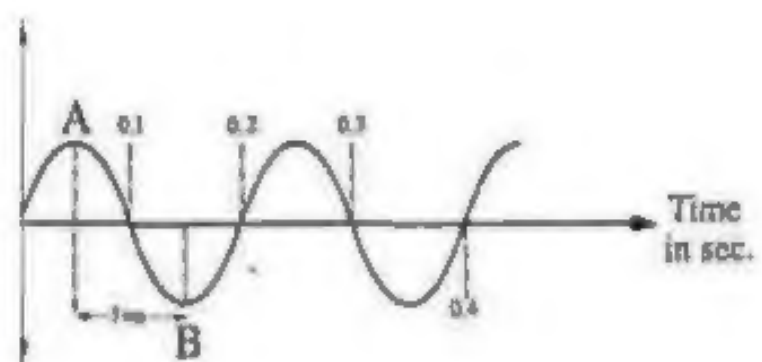
From the opposite figure, represents :

1. Wavelength.
2. Periodic time.
3. Frequency.
4. Wave velocity.
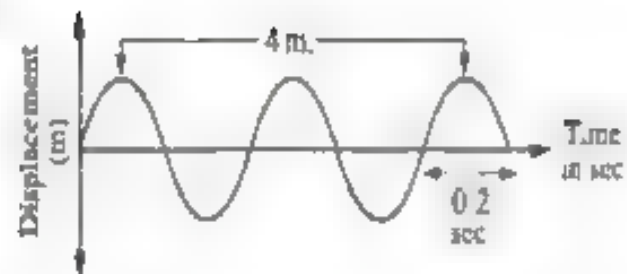
The opposite figure represents the relation between the displacement (cm.) and the time taken by a transverse water wave. Find:

1. Amplitude
2. Wavelength
3. Periodic time .
4. Frequency .
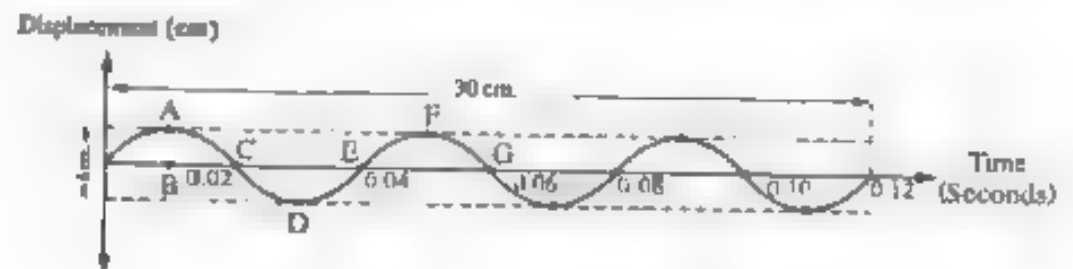
Sound characteristic

Complete:

1-In Savart's wheel by using the same gear, the sound produced will be sharper by increasing its...........................

2-Some animals such as ...., ...and......... .. .. . Can hear ultrasonic waves

3-The measuring unit of the sound intensity is......, while that of noise intensity is...... .. ..

4-The intensity of sound at a certain point is measured by the quantity of sound energy falling in one second on a....................at this point

5-...... . ...waves are used in medical diagnosis and in breaking   ...... .and.. ....stones

6-The human ear can differentiate between the sounds through three different factors which are... ...., ...and. ....

7-The velocity of sound through solids is ....than that through gases and its velocity through gases is ....than that through liquids

8-The sound intensity is a characteristic by which human ear can differentiate between...............and.............sounds

9-Ear plugs made of ....are used to avoid hazards of ......In loud places

10-The human ear can't detect the sounds waves of frequencies less than...............and that of frequencies more than....................

11-Sound intensity at a certain point is.............proportional to the square of the amplitude

Give reasons:

1-When you use Savart's wheel, you change the speed of wheel rotation

....

2-Piano's sound differs from that of a violin even if they have the same intensity and pitch

....

....

3-The explosions occurred on the sun surface can't be heard on the Earth

....

....

4-The tuning fork of frequency 251 Hz gives rougher sound than that is produced by another tuning fork of 512 Hz

....

....

5-The infrasonic waves are used for weather forecast

....

Write the scientific term:

1- The property by which the human ear can distinguish between different sound even they are equal in intensity and pitch.

2- It is the disturbance that propagates and transfers the energy in the direction of propagation.

3-Sound waves of frequency less than 20 Hz.

4- A tone of regular frequency that is produced from piano.

What is meant by ?

1-The inverse square law in sound

....

2-Harmonic tones

....

3-Sonic waves

....

4-Sound pitch

....

5-Sound type

....

Put (√) or (x) and correct the wrong ones:

1-As the amplitude of a vibrating body is doubled, the intensity of sound increases four times ( )

2-Sonic waves are used to sterilizing food substances ( )

3-The pitch of sound increases by increasing frequency ( )

4-The human ear can distinguish between sounds through two different factors sound pitch and sound type ( )

5-Sound waves are longitudinal waves that propagate through the medium as pulses of crests and troughs ( )

6- The Sound of the electric bell is the highest when it is put under a bell jar evacuated from the air ( )

7-If the speed sound through air 340 m sec and the frequency of a vibrating body 170 Hz, so the wavelength = 2 meters ( )

8-As the length of the vibrating string decreases, the frequency of the produced sound increases ( )

Problems:

1-Find the number of rotations in 2 minutes made by Savart s wheel producing sound of frequency 300Hz, if a metallic plate touches one gear of 100 teeth

....

....

2-A sound source produces 3600 cycles in 3 minutes, if its wavelength is 17 meters, find the velocity of the sound waves.

....
....

3. Calculate the frequency of a tone produced from savart's wheel when touching a gear of 30 teeth that rotates in 960 cycles in two minutes.

....
....

4. Savart's wheel rotates with a rate of 300 cycles per minute. A sound frequency 600 Hz is produced when an elastic plate touches teeth of gear. Calculate the number of the gear teeth.

....
....

Light characteristic

Complete:
1-A woolen jacket causes....................reflection of light rays, while a stainless steel sheet causes.................reflection of light rays

2-When a light ray travels from water to air, the angle of .... Is greater than the angle of.....................

3-If the absolute refractive index of a medium is 105 and the velocity of light through air is 3×10^8 m/s., therefore, the velocity of light through the medium is.....................

4-Light ....is the change of light path when it travels from a transparent medium to another transparent medium of different ....

5-When a light ray falls perpendicular on a reflecting surface, it reflects................, because the angle of incidence and the angle of reflection equal................ .

6-The optical density of a medium differs from one medium to another due to the change in the.....................through such medium

Give reasons:
1-The optical density of a medium differs from one medium to another

....

2-When a light ray travels from air to water it refracts near the normal

....

Put (√) or (x) and correct the wrong ones:
1-When a light ray travels from water to air, it refracts near the normal ( )

2 The reason of light refraction is that its velocity is equal in the different transparent media ( )

3-The absolute refractive index of any transparent medium is always greater than one ( )

Write the scientific term:
1-A smooth or rough surface at which the reflection of light takes place(.........................)

2-The angle between the reflected ray and the line perpendicular to the reflecting surface at

the point of incidence (...........................)

3-The ability of the medium to refracts light rays (.................. ....)

4-The ratio between the velocity of light through air to the velocity of light through another transparent medium (......... ....)

5- The ability of the medium to refract light rays.

What is meant by:

1-Angle of incidence

2-Regular reflection of light

3-Light refraction

5-The absolute refractive index of a medium

6-Optical density of a medium

PROPLEM

Calculate the absolute refractive index of diamond given that the speed of light through it is 1.5×10^8 m/sec. knowing that the light velocity in air is 3×10^8 m/sec.

....

....

Reproduction in plant

Complete:

1-The typical flower has a thin neck called...................ending in a swollen part called.......................which carries the floral leaves

2-The anther consists of............chambers. each of them contains a large number of.........

3-Androecium is the........reproductive organ of the flower, and it consists of a group of......

4-The bisexual flower is called..............., while the male or female flowers are called....

5-.....................is the transfer of pollen grains from the flower anthers to the...............

6-Pollination process takes place by.......................in flowers which produce dry and light pollen grains, while it takes place by.......... In flowers which produce sticky pollen grains

7-.......................is an example of a fruit with a single seed. while............... ...is an example of a fruit with many seeds.

8-The tuber is a....................as sweet potatoes or a....................as potatoes.

9-Artificial vegetative reproduction is carried out by three methods which are...............,

.... .and.. ....

10-In grafting by wedge, the scion is........ .into a..........in the stock such as...............

11-The cut is a part of.. ...., stem or.... .. ..

Give reasons:

1-Palm flowers are unisexual

....

....

2-Flowers pollinated by air having hanging anthers

....

14

....

3-Sometimes, man has to pollinate palm trees

....

....

4-Tissue culture is a good method for plant reproduction

....

....

5-The petals of corolla are colorful and scented

....

....

6-The stigma of air pollinated flowers are feathery like and sticky

....

....

Write the scientific term:

1-The swollen part upon the pedicle on which the floral leaves exist (..........................)

2-An organ in the flower which consists of ovary, style and stigma(........................)

3-The transfer of pollen grains from the anther of a flower to the stigma of the same flower or to another flower in the same plant   (............................)

4-The position of the entrance of the male nucleus to the ovule inside the ovary (..............)

5-The method of grafting in which the scion is attracted to the stock ....)

6-An organ of sexual reproduction in the flowering plants (.......................)

7-Colored and scented leaves of the flower which attract insects (........ ....)

Put (√) or (x) and correct the wrong ones:

1-The tuber of sweet potatoes is a part of a stem ( )

2-Insects pollinated flowers are characterized by colored and scented petals ( )

3-Corolla is a group of colored leaves, each leaf is called a sepal ( )

4-The innermost whorl of female flower is the androecium ( )

5-In tissue culture, the tissue is separated from the lower part of the stem ( )

6-When an orange scion is attached to naring stock, the produced fruit belongs to naring ( )

7-In reproduction by cutting, buds buried inside the soil grow to form the shoot system ( )

8-Rhizomes, corms, bulbs and tubers are ways of artificial vegetative reproduction ( )

What is meant by?

1-Micropyle.. ....

2-Fertilization..

3-Inflorescence... ....

4-Cross pollination.. ....

5-Hermaphrodite. ....

6-Calex .. . .

Reproduction in HUMAN

Complete:

1-The two testes lie......, ... the body in a structure called ....

2-The human male reproductive system consists of..........., two vasdeferens,. ... .and......

3-Sperms are transferred from testes to the........ ...duct through the ....

4- The two ovaries lie inside the body in the lower part of of the ....cavity from the................

5-From the signs of puberty in female is the occurrence of...............every..................

6-The menstrual cycle starts at the age in female...........and stops at the age............

7-The two fallopian tubes are open in the.................corners of the................

8-Each ovary releases one ripe..............every.................day in exchange with the other ovary in a process called....................

9-The middle part of the sperm contains...............responsible for energy production needed for the sperm...................

10-The vagina is a................tube that expands during...................

11-The period between fertilization and delivery is known as......Which extends about......

13-The second stage of embryo development starts from the beginning of the. .. ..week till the end of.. .. ..week.

Put (☑) or (×) and correct the wrong ones:

1-The fertilized ovum contains the complete number of chromosomes (   )

2-The age of menopause in female ranges between 11: 14 years   (   )

3-The fetus can move his hands and feet in the fourth stage of his development (   )

4-Uterine cancer is a genital disease which don't arise from sexual contact (   )

5-Production of sperms and male sex hormones is the function of prostate gland (   )

6-The offspring coming from asexual reproduction are different from their parents (   )

7-In human female, the two ovaries lie in the lower part of the pelvic cavity from the back (   )

8-The temperature of testes is four degrees above the normal body temperature (   )

Mention the function (importance) of each of the following:

1-The cytoplasm in the ovum:......... ....

2-The epididymis:

....

3-The tail of the sperm:...

4-The scrotal sac:...

5-Seminal fluid:

....

6-The uterus:........................... ....

7-Fallopian tubes:

....

Write the scientific term:

1-The type of reproduction in human beings (…………………)

2-The female sex hormone which is responsible for the occurrence and continuity of the pregnancy (……………………..)

3-A part of the ovum which contains the genetic material (…… ..   ……)

4-A part of the sperm which contains mitochondria (……… ………..)

5-The stage of the embryo development in which the head starts to differentiate and the eyes appear distinctly (……… ………..)

1- Group of glands, their function is to secrete seminal fluid.

4-A new method to produce large numbers of plants from a small part of it.

6- Short stem whose leaves are modified to the reproductive function

Give reasons:

1-Appearance of secondary sex characters in male

………… · …… ·   , ………… …………… ·· ·· ……… ·· ·· ········ ·· ··

………… ·· ··· ·· …… ·· ……………… ………… ·· ……………… ·········· ····

2-The inner wall of fallopian tubes is lined with cilia

…………………… · …………………… ·········· ,;·························

…………………… ·· ………………………………… ·························· ·········· ··

3-Zygote undergoes several successive divisions

··

···

4-Before delivery, the embryo position changes gradually to inverted

··

··

5-The baby can be born in the seventh month of pregnancy

···

··

7-Fallobian tubes are of funnel-shaped opening provided with finger like projections.

·· ····· ··················· ···· · ··················· ·· ··········· ·············· ···············

········· ··················· ·· ·· ················· ·· ···· ·············· ·········· ··

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Complete the following statements:

1. The outer whorl of the flower is called ……… …. ….., each leaf is called ………………
2. The male reproductive organ in flower is ……… , while the female reproductive organ in flower is …………………
3. The ………………hormone in male and ……………….. hormone in female are responsible for the appearance of secondary sex characters.
4. Fertilization is the process of fusing the male cell nucleus (pollen grains) with …………… Nucleus to form ………………
5. The egg contains ……………of genetic material of the plant species, while zygote contain …………… of genetic material of the plant species.
6. …….. glands and ……… gland are from glands associated with male genital system.
7. ………………. and ………………….. are female sex hormone.
8. After fertilization, the ovary grows forming .   …., while the ovule converts into ………
9. Each stamen consists of ……………… and ………… …. ..
10. The calyx is a group of .. .. ……………leaves, each leaf is called ……… … …...
11. The sperm and ovum are fused together to form …………… which carries ………… pairs of chromosomes.
12. Each ovary produces on ovum every . ….. …. days in exchange with the other ovary.
13. Calyx consists of green leaves called …. but corolla consists of colored leaves called …. ..
14. From the artificial vegetative reproduction in plants are . . .. .., . …. . and . … .. .. .
15. The testis function is to produce .. ………… …….. and secrete the ………… . . hormone.
16. The bisexual flower contains ……. ………. .. and ………. .. …….
17. The human zygote results from the fusion of ……. .. ….. and …… … . .
18. The sperm consists of ……. ………..., middle part and ……………..
19. ………………. differ according to the nature of the ovary either contain one or more ova.
20. The vas deferens transports ……………… from …… ……… To urethra.
21. Sweet potatoes is considered as …………., while the potatoes are …………… and reproduction of them is done by ………………..
22. Sharp tones have ……………, while rough tones have …………… frequencies.
23. The measuring unit of sound intensity is…….., while the measuring unit of noise intensity is ………………
24. The distance covered by light in one second is called………………
25. Frequency of sonic waves ranges between………Hz and …….Hz
26. The reflection is classified into two types which are …………… and ………………
27. Sound intensity is the property by which the ear can distinguish between ……. . and ………… sounds
28. Sound pitch is the property by which the ear can distinguish between …… … and ……… sounds
29. From the factors affecting sound intensity are . .. ……. .. and   ….. ……. …..

30. If the angle between the reflected ray and the perpendicular to the reflecting surface is 40°, the incidence angle is. . ...

31. A sound wave travels in air with velocity 330 m/s and has a wavelength of 0.5 m, its frequency is ....

32. Angle of ... . is the angle between the refracted light ray and the .... at the point of incidence on the separating surface.

33. The sound is considered from ....waves , because it needs a medium

36-Th ovum consists of............... cytoplasm and.....................

35. Sound intensity at certain point is .... proportional to the square of the distance between this point and the sound source, and is .... proportional to the square of the amplitude.

36. The ratio between light speed in air and light speed in a medium is called .. .. of a medium.

37-.....................and...................are female sex hormones

38-The vagina is a.................tube that expands during the.....................

39. If the angle between the incident light ray and the reflecting surface is 25°, so the angle of reflection = ...

40. As amplitude increases, the sound intensity ....

41. Savart's wheel is used to determine... ....

42. Hertz is the unit which measures the. .... of the oscillating body.

43. .... . is the measuring unit of frequency. while .. .. is the measuring unit of amplitude

44. The result of multiplying the frequency by periodic time equals..........

45. Transverse wave consists of.................. and ....

46. Longitudinal wave consists of..................and.... .. ..

47. The complete oscillation contain ,. .. ... successive displacements.

48. If the periodic time of an oscillating body is 0.1 sec., so the number of complete oscillations in one minute is ....

49. Waves are classified according to the ability to propagate and transfer energy into.................... and ....

50. .... travels in air with velocity 340 m/s

51. The periodic motion is the motion which is regularly repeated in equal......... .....

52. .... is considered the simplest form of oscillatory motion.

53. The sound is considered from................. waves, because it needs a medium.

54. When an oscillating body makes 500 complete oscillations in a time − 2 minutes, its periodic time equals.................

55- A sound wave of frequency 3000 cycles/sec. is called ....wave.

56-Flowers contain male and female reproductive organs is known as ....flowers.

57-In man, the zygote contains .... pairs of chromosomes.

58- If the distance between a surface and sound source decreases to its half, the sound intensity of the surface ....

59-Human can hear the sound which its frequency ranged between .... .and .... Hz.

60-Radio waves are considered … ..   … waves while sound waves are considered … waves.

61- The testes in male produce .. …….   .. and ……… .. …. hormone

62- The corolla in the flower is a group of ……… ….leaves. each leaf is called … …….

63-The velocity of the oscillating body reaches its…………. value when it passes its original position.

64-If the maximum displacement done by the oscillating body away from its original position is 0 2 cm which is made in 0.5 second, so the amplitude is …………….and the periodic time is………………

65-The movement of…………….and……………..are examples of oscillatory motion.

66-Waves are classified according to the direction of vibration of medium particles relative to the direction of propagation into………… ……..and ……………waves.

67-Jaccuzi is used to treat…………….and cramps by using hot water and ………………..by using……………..

68-The wave frequency is the number of……………….produced from the source in one…………………

69-…………. …is the area in the longitudinal wave at which the medium particles are of highest density and pressure.

70-The human ear can differentiate between the sounds through three different factors, which are sound……………, … …… …..and……. .. …….

71-Savart's wheel is used to determine the…… . ………of unknown sound tones.

72-The measuring unit of the sound intensity is… .. … . .. …while that of noise intensity is…………………..

73-When the amplitude of sound wave vibration is doubled, the intensity of sound. …………..four times.

74-………………..waves are used in medical diagnosis and in breaking ……………….and…………….stones.

75-The sound intensity at a point is……………..proportional to the square of the distance between the point and the sound source which is known as………

76-The human ear can't detect the sound waves of frequencies less than ………….and that of frequencies more than……………….

77-In Savart's wheel by using the same gear, the sound produced will be sharper by increasing its………… ……. .

78-The first law of sound reflection states that………………….. ………..

79-Tissue culture is a process of … . . … ……..a small part of a plant to get many .. ..parts

80-Some animals like…………..use echo to fly in dark without colliding with any surface because they produce………   ….waves whose frequencies more than…….. …

81-If the sound ray is incident perpendicular to a reflecting surface, it reflects …………..because the angle of incidence= angle of. .. …. ..‾ ……………. .

82-Energy of photon =. ……………… × ………. …………

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83-The.. ....color has the highest frequency and shortest wavelength, while the... ....color the lowest frequency and longest wavelength.

84-Light intensity of a surface is. ....proportional to square of the distance between the surface and the light source.

85-.... ....and. ....are technological applications of light reflection.

86-From the natural phenomenon that are related to the reflection and refraction of light are....................., ...and.................

87-The absolute refractive index of a medium is the ratio between..........to....

88-When a light ray travels from water to air, the angle of....................is greater than the angle of....................

89-The floral leaves of calyx have..........color and each one is called ....

90-.................and...................are examples of unisexual plants, while ....and................are examples of bisexual plants

91-Types of pollination are.................and ....

92-After fertilization, the ovary grows forming the...............while the ovule converts into the.................... ....

Choose the correct answer:

1. Pollen grains are produced in.............

a. stigma   b. filament   c. anther   d. ovary

2. The floral leaves of typical flower are arranged in .... floral leaves.

a. two   b. three   c. five   d. four

3. The flower is a modified .... a. stem   b. leaf   c. root

4. The zygote contain .... of the genetic material of egg cell.

a. half   b. all   c. quarter

5. The bisexual flower contains ....

a. only androecium   b. only gynoecium   c. androecium and gynoecium

6. After fertilization, the ovary grows forming ....

a. seed   b. fruit   c. flower

7. The green leaves surrounding the flower are   ....

a. carpels   b. stamens   c. petals   d. sepals

8. Fertilization is the process of fusion of male and female cells to form ....

a. zygote   b. sperm c.   ovum   d. pollen grain

9. The floral whorl which is not found in the female flower is ....

a. calyx   b. androecium   c. corolla   d. gynoecium

10. A mobile cell of a relatively small size in human is called ....

a. sperm   b. ovum   c. ovule   d. pollen grain

11. .... occur when zygote is formed

a. embryo   b. fertilization   c. pollen grain   d. ovum

12. All the following are parts of male reproductive system except.................

a. vas deferens   b. uterus   c. testis   d. Cowper's gland

13. All the following methods are examples for artificial vegetative reproduction except..............

a. cutting   b. bulbs   c. grafting   d. tissue culture

14. All of the factors affecting sound intensity except..... .. ..

a. amplitude   b. frequency   c. medium density   d. wind direction

15. The angle between the incident light ray and the reflected light ray is 40°, so the angle of reflection is ....

a. 20°   b. 40°   c. 80°   d. 90°

16. The number of teeth gear in savart's wheel increase, the .... of the produced sound increase

a. amplitude   b. intensity   c. frequency   d. quality

17. All the following from natural phenomena related to light refraction except.........

a. echo   b. mirage   c. seeing objects higher than normal position

18. The human ear can hear sound of frequency.....................

a. 300 Hz   b. 30 KHz   c. 50 KHz

19. If the angle between the incident light ray and the reflecting surface = 40°, so the angle of reflection of light = ...

a. 30°   b. 40°   c. 50°   d. 60°

20. The sound of frequency 200 Hz is .. .. than the sound of frequency 100 Hz

a. stronger   b. sharper   c. weaker   d. harsher

21. The amplitude of the harmonic tone is .... that of fundamental tone.

a. smaller than   b. larger than   c. equal to   d. (a) and (b) are correct

22. The doctors use waves which have frequency .. .. to break down kidney and uterus stones.

a. less than 20 Hz   b. 20 Hz   c. more than 20 KHz

23 When a light ray passes from glass to air, it refracts .... to the normal.

a. near to   b. away from   c. perpendicular to

24. If the distance between sound source and the ear increases 3 times, so intensity of sound............

a decreases to –   b. increases 3 times   c. decreases to –   d. increases 9 times

25. All the following are examples of the oscillatory motion except...............

a. swing   b. spring   c. rotary bee   d. tuning fork

26. .... is (are) mechanical waves.

a. water waves only   b. sound waves only c   . both (a) and (b)

27. All the following are electromagnetic waves except.............. ..

a. light   b. sound   c. x-ray   d. radio

28. The periodic time of an oscillating body which makes 240 oscillations in one minute – ....

a. 1 sec.   b. 0.25 sec.   c. 0.5 sec.   d. 4 sec.

29 A vibrating body makes 240 complete oscillation in one minute , its periodic time equals ....sec.(¼ – 2 –½ –4)

30. If the angle between the incident light ray and reflected light ray is 60°, so the angle of reflection equals ....(15° – 30° - 90° – 120°)

31 The wave transfers . .....in its direction of propagation. (particles - energy - matter - force)

32. The human ear cans sounds of frequency ......(50 KHz 30 KHz- 300 Hz -10 Hz).

33. Inflorescence is a group of .... On a floral axle. (Fruits – leaves – seeds - flowers).

34. **Which of the following graphs represents** the relation between frequency (F) and periodic time (T)? Why?
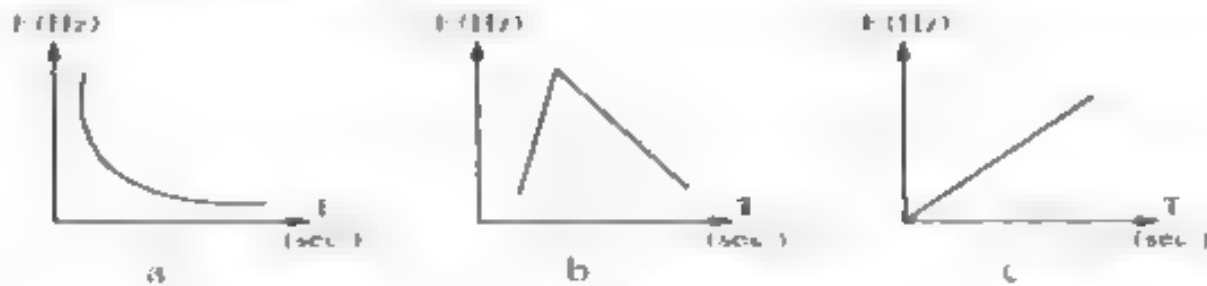
35. The complete oscillation includes . ...successive displacement. (One two three – four).

36. Sound velocity through air may be ....(330 m / sec .only   340 m/sec   350 m / sec – all previous answers)

37. From the opposite figure the ratio between the angle of incidence to the angle of refraction equals................ (6/5 – 3/5 – 3/2 – 2/3).

38. If sound frequency 3000 vibrations second is produced, we call its waves are .... Waves (sonic - ultrasonic - infrasonic – transverse).

39. Media that we can see object less clearly through them called............ (Opaque media – transport media   translucent media   spectrum colours).

40. Light waves are ....waves (mechanical transverse – electromagnetic transverse – electromagnetic longitudinal – mechanical longitudinal).

41. A simple pendulum make one amplitude in 0.01 of a second, its frequency is...................Hz (0.04 -0.004 -.25 – 0.25).

42. The figure ....represents the relation between the intensity of sound and the square of amplitude of vibration of a vibrating body.
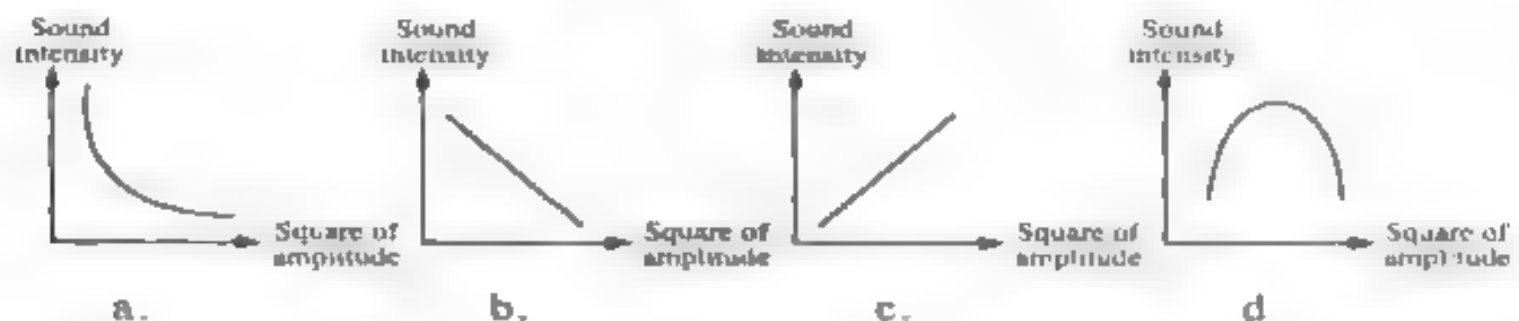
43. The sound of frequency 200 Hz is .... than the sound of frequency 100 Hz.

 a- sharper   b-stronger   c-harsher   d-weaker

44. The left ovary in female human produces a mature (ripe) ovum every. ....days.

 a-24   b-56   c-28   d-30

45. It is more common for the cut to be a branch carrying many ....

 a-leaves   b-fruits   c-stems   d- buds

46. If the angle between the incident sound ray and the reflecting surface is 50^0, so the angle between the incident sound ray and the reflected sound ray equals... .. ..
   a-40^0 b-50^0 c-80^0 d-60^0

47. The complete oscillation include .... displacements.
   a-one   b-two   c-three   d-four

48. if the distance between the center of the third compression and the center of the fifth compression equal 20 cm , the wavelength of this wave is ....
    a-40 cm   b-20 cm   c-10 cm   d-5 cm

49. Flowers can be pollinated by ....
   a-insects   b-air   c-man   d-all the previous answers

50. The doctors use waves with a frequency ....to break down kidney's stones.
   a-less than 20 Hz   b-20Hz   c-10 Hz   d-more than 20Hz

51. The male reproductive organ in flower is ....
   a-calyx   b-corolla   c-androecium   d-gynoecium

Give reasons:

2-FLAX plant reproduce by Auto pollination.

.... / ....

2-Auto pollination can't happen in sunflower.

.... , , ..., ...
.... ,,,...........,... ....

3-Oscillatory motion is considered as a periodic motion.

.... ,.. ....
....,,.,............ ....,.,..

4-The energy of red light photon is less than that of orange light photon.

....

5-Palm flower are unisexual.

. ...
....

6-The absolute refractive index for any transparent medium is always greater than one... ....
....

7-The product of frequency and periodic time equals one.

....
....

8-If a sound ray is incident perpendicular to a reflecting surface, it reflects on itself.

....
....

9-The petals of corolla are colorful and scented.

....
....

24

10-The two testes lie outside the body in scrotal sac.

....

....

11-The waves due to vibration of strings are mechanical transverse waves.

....

....

13-Fallopian tube is lined with cilia.

....

....

14-The uterus is a suitable organ for the growth of embryo.

....

....

16-Peach fruit has one seed, while the pea fruit contains more than one seed.

....

17-Piano's sound differs from violin's sound even if they have the same intensity and pitch.

....

....

18-We see lightning before hearing thunder.

....

....

19-The use of ultrasonic waves in milk sterilization.

....

....

20-The sound can be heard from all surrounding directions.

....

....

23-Pollen grains of wind pollinated flowers are produced in a huge number.

....

24-The seminal fluid is alkaline.

....

25-Sound intensity increases when the source of sound touches a resonance body.

....

26-Man can't reproduce asexually

....

....

27-The inability to see the impurities present in black honey.

....

28-The baby can be born in the seventh month of pregnancy.

....

....

What happens when?

1- The sperm has no tail.

....

....

2- Decreasing the amplitude of the wave into half (concerning to sound intensity).

....

....

3- To the ovary of the flower after fertilization.

....

....

4- The frequency increasing double (concerning to periodic time).

....

....

5- When the length of violin string decreases during playing.

....

6- When incidence of a white light ray on one face of a triangular glass prism.

....

Put (√) or (x) and correct the wrong ones:

1-Complete oscillation is the maximum displacement done by the oscillating body away from its original position. ( )

2-The wall of the ovary after fertilization forms the coat of the ovary. ( )

3-Cartoon and human skin are examples of opaque medium. ( )

4-Pollination by air is done in case of the feathery anther. ( )

5-The measuring unit of sound intensity is watt/ m2. ( )

6-Echo is the repetition of sound produced due to its refraction. ( )

7-The carpel consists of ovary, style and stigma. ( )

8-Human ear can hear sound ranges between 20 Hz to 2000 Hz. ( )

9-The complete oscillation includes 3 displacement. ( )

10-Periodic time + frequency = one ( )

11-We hearing thunder before seeing lightning. ( )

12-Savart's wheel used to determine sound intensity. ( )

13-Movement of pendulum is a wave motion. ( )

14-Sound velocity in air is less than that in liquid. ( )

15-Anthers produce ovules. ( )

16-Metallic pots are used in microwave oven. ( )

17-Sound can't travel through space. ( )

18-The speed of mechanical waves are relatively low. ( )

19-Concave surfaces are used to concentrate sound waves. ( )

20-The temperature of testes is four degrees below the normal body temperature. ( )

21-Mixed pollination in palm trees is carried out by man. ( )

22-Reproduction by tuber happens in orange. ( )

23-The depth of the sea determined from the relation $d = Vt / 2$ ( )

24-Sonic waves are used in sterilizing food substances. ( )

25-Violet color has the longest wavelength. ( )

26-Androecium is the female reproductive organ in the flower. ( )

27-Sperms transfer from testes to urethra through the epididymis. ( )

28-The lowest point in transverse wave is called crest ( )

What is meant by:

1-Sound quality:

....
....

2-Amplitude:

....
....

3-Mixed pollination:

....
....

4-Fertilization:

....
....

5-Scortal sac:

....
....

6-Corolla:

....
....

7-Wavelength:

....
....

8-Light intensity:

....
....

9-Sound pitch:

....
....

10-Inverse square law of sound:

....

11-The absolute refractive index:...

....

Mention one use of:

1-savart's wheel:

....

2-Ultrasonic waves in military field:

....

3-The mid-piece of a sperm:

....

5-Calyx in flower:

....

6-Fallopian tube:

....

7-Seminal fluid:

....

8-Jacuzzi (physiotherapy tubes):

....

9-The vas deference:

....

10-Radio waves:

....

11-The uterus:

....

STUDY FIGURES

1- From the opposite figure calculate
1. Wavelength
2. Periodic time
3. Frequency
4. Wave velocity
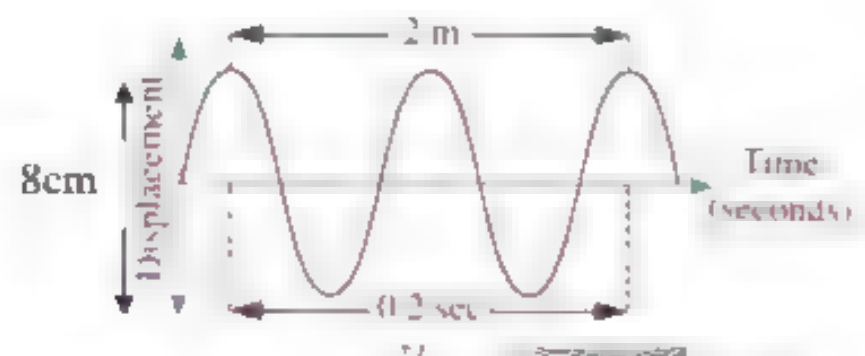
2- Look at the opposite figure, and then answer the following questions:

a. What does the figure represent?

b. Label the figure.

3- Look at the opposite diagram then answer the following:

a. What is the name of this system?

b. Replace the numbers on the figure by the suitable labels.

c. What is the organ which....?

I. Ova are produced

II. The ovum is fertilized

III. Fetus is growing

IV. The embryo delivered to life

V. Secrete progesterone

28

1- **Look** at the opposite figure, and then answer the following questions:
   a. what is the sex of the flower
   b. Label the figure
   c. The organ which consists of parts (7), (8) and (9) is called.. … ………. ….
   d. The organ which consists of parts 5 and 6 is called……

2- **Mention** the sex in each flower from the following:

The opposite figure shows a flower being pollinated by wind (air):
A-Write the labels for each of (X) and (Y).
B-Mention two characteristics that make this flower pollinated by wind (air).
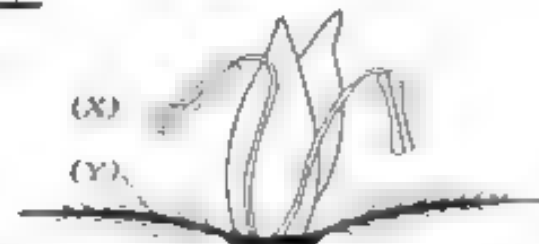
3- **The given shows** the relation between displacement and time for a transfers wave which moves through water with velocity 20 m /sec from the figure find:

   - The amplitude of the wave.

   - The wavelength.
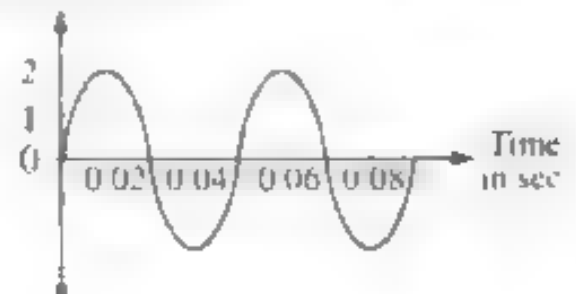
4- **In the given figure**, which angle represents angle of incidence and angle of reflection?
What is the relation between them?

From the opposite figure:

1. What does the angle represent:
a- Angle of incidence   b- Angle of refraction
2. Which of the media (A) or (B) has more optical density?
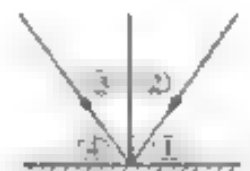
5- **In opposite figure:**
A simple pendulum vibrating with a frequency of 5 Hz. calculate the time taken by the pendulum to reach the maximum displacement away from its original potion.
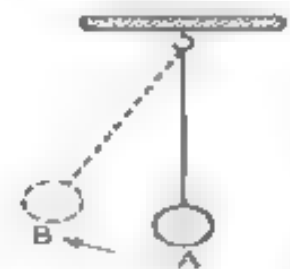
6- **Complete the path of rays** of the following figure and calculate the angle of emergence from point (X) given that the optical density of air is less than plastic.
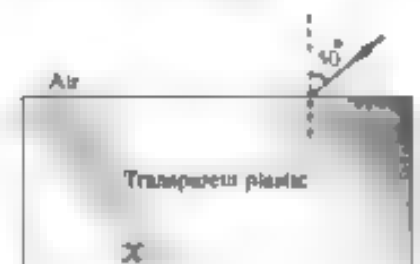
7- **The following figure represents an organ from the flower,** study the figure then answer the question:

1. Name the organ in the figure.
2. Mention label.
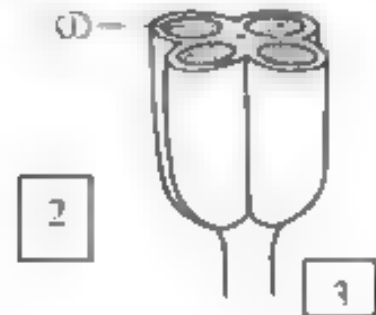
8- **From the opposite figure:**

Wavelength ... .

Periodic time ... ...

Frequency... ....

Wave velocity.......... ...
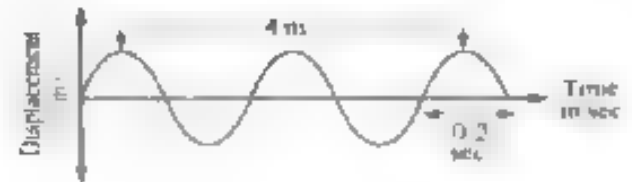
9- **Study the opposite figure, and then complete:**

- The distance $\overleftrightarrow{AB}$ is called ....
- Number of waves is................ ....
- Wavelength is...................................
- Knowing that the frequency of this wave is 30 Hz, calculate its velocity of propagation,
- What is the kind of this wave and what is its velocity of propagation when it produces 600 vibrations in a minute
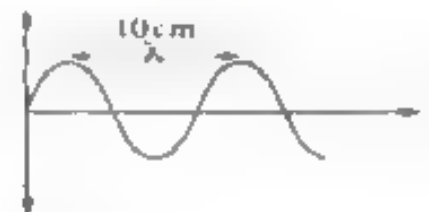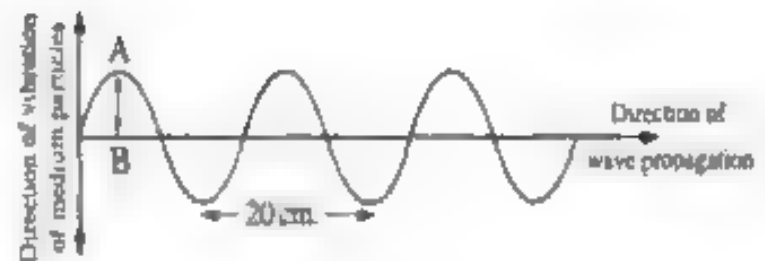
10- **Complete the path way of the rays on the following, figures and draw them completely in your answer paper,**
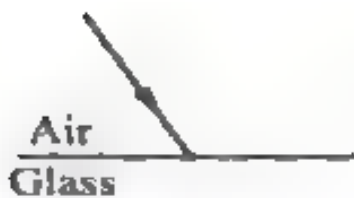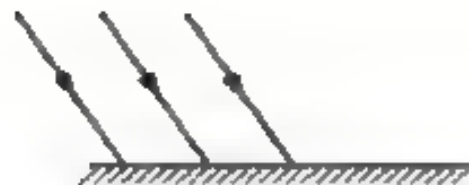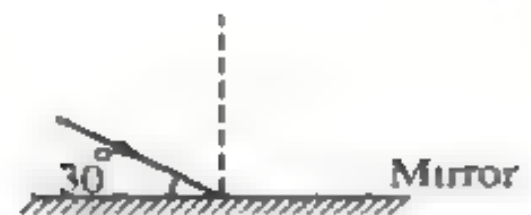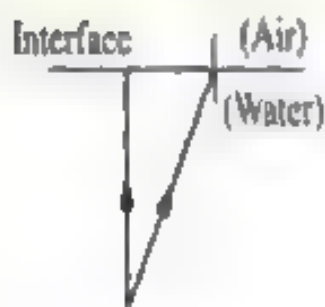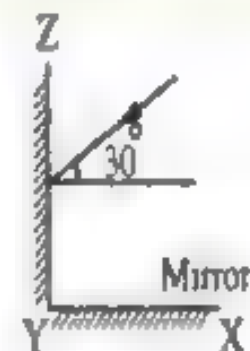
Air
Glass

(1)

(2)

30 Mirror

(3)

Interface (Air)
(Water)

(1)

(2)

Z
30
Mirror
Y   X

(3)

30

Correct the underlined word:

1. The <u>stamen</u> consists of stigma, style and ovary.
2. The <u>corolla</u> is the male reproductive organ in the flower
3. <u>Ovaries</u> produce sperm and male hormone.
4. The egg contains <u>quarter</u> of the genital material of plant species
5. Palm trees are pollinated by <u>air</u>.
6. The two glands that lie outside the body in scrotal sac are called two <u>anthers</u>.
7. From type of reproduction are sexual and <u>bisexual</u>.
8. The <u>estrogen</u> hormones are responsible for pregnancy take place and continue.
9. In pollination by <u>water</u>, the flower has feathery like and sticky.
10. The <u>rose</u> is a group of flowers arranged on the same axle.
11. <u>Ovule</u> consists of stigma, style and ovary.
12. The <u>ovum</u> is a mobile cell, of a relatively small size.
13. The <u>ovaries</u> are adapted to receive the ovum and deliver it to the uterus.
14. Sugarcane is reproduced by <u>grafting</u>.
15. <u>Penis</u> transfers the sperms from the testis to the urethra.
16. The angle of incidence light ray is <u>greater than</u> angle of reflection.
17. The sound velocity through liquids is <u>less than</u> that through gases.
18. Human ear can distinguish sounds of frequency ranging between <u>10: 10000</u> Hz.
19. <u>Infrasonic</u> waves can be used to determine industrial defects.
20. Angle of <u>refraction</u> – angle of reflection
21. Particles of the medium vibrate along the direction of the wave propagation in the <u>transverse</u> wave

Circles the odd word, and then write the relation between the rests:

1. Pendulum's motion / spring motion / rotary bee motion / stretched string motion.
2. 21 Hz / 19 Hz / 10 Hz / 5 Hz

Mention the relation between:

1. The frequency and wavelength.

2. Amplitude and complete oscillation of an oscillating body.

3. The absolute refractive index of a medium and velocity of light through this medium.

Problem:

1- Sound waves of frequency 200 Hz and wavelength 1.7 meter. Calculate the velocity of sound waves propagation through air.

2- Calculate the wavelength in micrometer for a light wave of frequency 6×10^8 megahertz and its velocity is 3×10^8 m/sec.

3- Calculate the velocity of a wave, its frequency is 100 megahertz and its wavelength is 0.3 meter.

4- If the distance between sun and earth is 1.47×10^{11} meters, calculate the time required for the light to travel from the sun to earth.

5- If the absolute refractive index of water is 4/3 and the velocity of light through water is 2.25×10^8 m/sec, calculate the velocity of through air.

6- Sound waves have a frequency 400 Hz in air and its wavelength is 85 cm. calculate the velocity of these waves.

7- Calculate the number of rotation in 2 minutes made by savart's wheel producing sound of frequency 300 Hz. If the metallic plate touches one gear of 100 teeth.
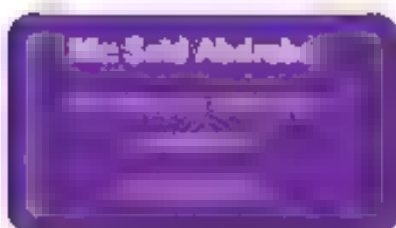
BEST WISHES

MR.SAID

Final Revision

Mr. Ahmed Elbasha

● (1) Write the scientific term:

1	Non-audible waves whose frequencies are less than 20 Hz.
2	Maximum displacement of the oscillating body away from its rest position.
3	The transfer of pollen grains from the anthers of a flower to the stigmas of another flower of the same kind.
4	The measuring unit of noise intensity.
5	The flower that has four whorls.
6	The ability of the medium to refract light.
7	The flower which contains both androecium and gynoecium.
8	The motion produced as a result of the vibration of the particles of the medium at a certain moment in a definite direction.
9	The motion of an oscillating body when it passes by a fixed point on its path two successive times in the same direction.
10	It is an external stimulus that affects the ear and causes hearing.
11	The process of transfer pollen grains from the flower anther to the stigma.
12	A tool is used to determine the pitch of an unknown tone.
13	A group of green leaves each of them is called sepal.
14	The cell resulting from the fusion of the pollen grain and the ovum nuclei.

15	The reflection in which light rays recoil in many different directions when falling on the rough surface.	( )
16	The amount of light that falling perpendicular to a unit area of a surface in one second.	( )
17	The property of sound by which the human ear can be distinguish between sharp and harsh sounds	( )
18	The time taken by the oscillating body to make one complete oscillation.	( )
19	The highest point in the transverse wave.	( )
20	The measuring unit of sound intensity	( )
21	The number of complete oscillations made by the body in one second.	( )
22	It is a natural phenomenon that takes place on the desert roads at noon especially in the summer times.	( )
23	The change of light path when it travels from a transparent medium to another.	( )
24	A disturbance that propagates and transfers energy along the direction of propagation	( )
25	The angle between the emergent light ray and the normal.	( )
26	Angle of incidence= Angle of reflection	( )
27	The periodic motion of an oscillating body around its rest point, where the motion is repeated through equal intervals of time.	( )
28	Waves that need medium to travel and can't travel in space	( )
29	A property by which the human ear can distinguish between strong and weak sounds.	( )
30	Rebounding of light waves in the same medium due to meeting a reflecting surface.	( )
31	An angle between the incident light ray and the normal at the point of incidence on the interface.	( )
32	The flower that contains the four whorls	( )

33	The point of the lowest density and pressure in the longitudinal wave	(........)
34	Bodies don't allow the passage of light through them.	(........)
35	A new method to produce large numbers of plants from small parts of it.	(........)
36	A floral whorl in the flower, whose function to attract insects as it is colorful and scented.	(........)
37	The time needed by the oscillatory body to make a complete oscillation.	(........)
38	Waves of frequencies ranging from 20 Hz to 20000 Hz.	(........)
39	The intensity of sound at a certain point is inversely proportional to the square of the distance between this point and the sound.	(........)
40	The scientist who discovered that the energy of photon depends on its frequency.	(........)
41	The ability of the medium to refract light rays.	(........)
42	Fusion of the nucleus of the male cell with the nucleus of the female cell.	(........)
43	The disturbance that propagates and transfers energy in the direction of propagation	(........)
44	The area in the longitudinal wave, at which the medium particles are of the highest density and pressure	(........)
45	The distance that a wave travels in one second.	(........)
46	The product of Planck's constant times the frequency of photon.	(........)
47	A modern way of multiplying a small part of the plant to get a large number of plants	(........)
48	The ratio between the speed of light in air and its speed in a transparent medium.	(........)
49	Wave consists of crests and troughs.	(........)

50	Short stem where the leaves developed and modified into reproductive organs.	( )
51	The waves which need a medium to propagate.	( )
52	The reflection in which the light rays recoil in many directions, when falling on a rough surface.	( )
53	A phenomenon that appears in the desert as a result of reflection and refraction of light.	( )
54	The property by which the ears can distinguish between sounds with respect to the nature of the source even if they are equal in pitch and intensity.	( )
55	The motion produced as a result of the vibration of the particles of the medium at a certain moment and in a certain direction	( )
56	The angel between the reflected ray and the normal at the incidence point on the reflecting surface.	( )
57	The ability of the medium to refract light rays.	( )
58	The number of complete oscillations in one second.	( )
59	Sound waves their frequency is more than 20000 Hz.	( )
60	Incident ray, reflected ray and normal line, all locate in one plane which is perpendicular on reflecting surface.	( )
61	An instrument used to determine the frequency of unknown sound tone.	( )
62	A design composed of a tube, where water moves in the form of circular waves for treating sprains and cramps.	( )
63	Sound waves have frequency less than 20 Hz.	( )
64	A male hormone that responsible for the appearance of secondary sex characters	( )

■ (2) Choose the right answer:

1. The zygote contains ….   of the genetic material of the sperm.
   - a. half
   - b double
   - c. quarter
   - d. three times

2. The light ray refracts   ..   the normal when it travels from air to glass.
   - a. near to
   - b. away from
   - c. perpendicular to
   - d. along

3. All the following are from the factors affecting sound intensity except the .
   - a. amplitude
   - b frequency
   - c density of medium.
   - d. wind direction

4. The ovule after fertilization becomes a ....
   - a. seed.
   - b. seed coat.
   - c. fruit.
   - d. coat of fruit.

5. The amplitude of the simple pendulum is …….   of a complete vibration.
   - a. four times.
   - b a quarter.
   - c. a half
   - d. double

6. The quantum of energy of green light is ….   the quantum of energy of yellow light.
   - a. greater than
   - b equal to
   - c. less than
   - d. no correct answer

7. Light waves are .... waves.
   - a mechanical transverse
   - b. electromagnetic longitudinal
   - c. electromagnetic transverse
   - d. mechanical longitudinal

8. A sound wave travels in air with velocity 330 m/s and has a wavelength of 0.1 m, its frequency is ....
   - a. 330 KHz.
   - b. 3300 Hz.
   - c. 33 KHz.
   - d. 330 Hz.

9. From the typical flowers is ..
   - a. palm
   - b. maize
   - c petunia
   - d. pumpkins

10. The absolute refractive index of water is ……. ……..
    - a. 0.5
    - b 0.8
    - c. 0.33
    - d. 1.33

11 The ovum contains ..   of the genetic material of the plant species
   - a. double
   - b. half
   - c quarter
   - d. all

12 The artificial vegetative reproduction is done in plants by ..
   - a grafting.
   - b. cutting.
   - c tissue culture.
   - d. all the previous.

13 When the incident light ray reflects on itself, the angle of incidence equals … ……..
   - a 0°
   - b. 90°
   - c 120°
   - d. 180°

14. When the distance between the source of light and the surface of a wall is doubled, the light intensity on the surface .. ..
   - a. decreases to a quarter.
   - b. increases to double.
   - c. remains constant.
   - d. no correct answer

15. The speed of the ball of the simple pendulum ... as we move away from the rest position.
   - a. doesn't affect
   - b decreases
   - c is doubled
   - d no correct answer

16. The .... color light in the spectrum colours has the highest deviation.
   a. white | b. red | c. violet | d. yellow

17. The corolla leaves are called ....
   a. petals. | b. carpels. | c. stamens. | d. sepals

18. Regular reflection appeared on ....
   a. the skin | b. a plan mirror | c. a tree leaf. | d. a piece of wood

19. Flowers pollinated by air characterized by all of the following except ....
   a. hanged anthers.
   b. feathery like stigmas
   c. scented petals
   d. light pollen grains.

20. If the distance between the center of the third compression and that of the fifth compression is 20 cm, the wavelength of this wave is ....
   a. 40 cm | b. 20 cm | c. 10 cm | d. 5 cm

21. Pollen grains are formed inside the .... of the flower.
   a. carpel | b. anther | c. ovary | d. calyx

22. The photon energy= Plank's constant x ....
   a. wavelength | b. velocity | c. amplitude | d. frequency

23. The distance between two successive compressions is called ....
   a. frequency | b. periodic time. | c. wavelength | d. velocity

24. If the frequency of an oscillating body is 10 Hz, so the periodic time is ....
   a. 10 sec | b. 0.01 sec | c. 0.1 sec. | d. 1 sec.

25. The sound of frequency 500 Hz is .... than the sound of frequency 100 Hz.
   a. stronger | b. sharper | c. weaker | d. harsher

26. When the distance between the light source and a certain surface is doubled, the light intensity on the surface ....
   a. decreases to quarter
   b. increases four times.
   c. is doubled.
   d. remains constant.

27. The angle of incidence of light is .... its angle of reflection.
   a. larger than | b. smaller than | c. equal to | d. no correct answer

28. After fertilization, the ovary develops to become a ....
   a. fruit | b. sepal. | c. petal. | d. flower.

29. Tulip is an example for .... flower.
   a. female | b. male | c. bisexual

30. After fertilization, the .... develops to become a seed.
   a. flower | b. ovary | c. ovule

31. Sound of frequency 200 Hz is .... than sound of frequency 100 Hz.
   a. sharper | b. stronger | c. harsher | d. weaker

32. If the angle between the incident light ray and the reflected light ray is 90°, so the angle of incidence equals . ...

a. 0° | b. 90° | c. 45° | d. no correct answer

33. The light waves are .. .. waves.

a. mechanical transverse

b. electromagnetic transverse

c. mechanical longitudinal

d. electromagnetic longitudinal

34. The floral whorl, which is absent in the female flower is ....

a. calyx. | b. corolla. | c. androecium. | d. gynoecium

35. The sound velocity is maximum in

a. vacuum. | b. gases. | c. liquids. | d. solids

36. The periodic time of a tuning fork which makes 240 waves in one minute equals .

a. 1 sec. | b. 4 sec | c. 0 5 sec. | d. 0.25 sec.

37. . . .. .. waves are longitudinal waves.

a. Water | b. Light | c. Sound | d. Radio

38. If the angle between the incident light ray and the reflected light ray is 30° so, the angle of reflection is ......

a. 30 | b. 15 | c. 60 | d. 40

39. Pollen grains are produced from the .. ..

a. ovary | b. calyx. | c. anther. | d. gynoecium.

40. All the following are factors affecting sound intensity except . .

a. amplitude of vibration

b. frequency

c. medium density

d. wind direction

41. A medium that prevents light to pass through it is called . ... medium.

a. transparent | b. translucent | c. opaque | d. no correct answer

42. The submerged object in water as a fish is seen in an apparent position slightly above its real position due to .. of the light rays.

a. refraction | b. reflection | c. analysis | d. total internal reflection

43. From the methods of cross pollination is . , .

a. air | b. insects. | c. human. | d. all of them.

44. White light analyzes into . ... spectrum colours.

a. | b. 5 | c. 7 | d. 9

45. The measuring unit of wave velocity is .

a. meter | b. meter sec | c. Hz. | d. sec.

46. If the angle between the incident light ray and the reflected light ray is 40°, so the angle of reflection equals .. . .

a. 90° | b. 80° | c. 20°

47. The doctors use waves with a frequency ... ... to break down kidney stones.

a. less than 20 Hz   b. 20 Hz   c more than 20 KHz

48. Sound intensity in air is ... that in carbon dioxide.

a. less than   b. more than   c. equal to

49. The absolute refractive index of any material is always .... one.

a. less than   b. more than   c equal

50. In ... ... reflection, the reflected rays are reflected in many directions.

a. uniform   b. irregular   c. both (a) and (b)

51. All of these sounds are of uniform frequency except the sound of ......

a. piano.   b. violin.   c. loudspeakers.   d. guitars.

52. The highest point in the transverse wave is called .. ..

a. trough.   b. compression.   c. crest.   d rarefaction

53. All the following are electromagnetic waves except ... ... waves.

a. light   b. sound   c infrared   d radio

54. The voice of Adam differs from that of Sara because they are different in ......

a. age.   b. intensity.   c. pitch.   d. kind.

55. The quantum of energy of green light is ......, the quantum of energy of yellow light.

a. greater than   b. equal to   c smaller than   d no correct answer

56. ... media do not allow light to pass through it.

a. Transparent   b. Translucent   c. Opaque   d. no correct answer

57. The floral whorl which is absent in the female flower is ... .

a. calyx   b. corolla   c androecium.   d gynoecium

58. If the angle between the incident light ray and the reflected light ray is 90°, so the angle of reflection will be equal ....

a. 0°   b. 30°   c 45°   d 90°

59. Plank's constant= the photon energy divided by photon ....

a. frequency   b. density.   c. wavelength   d. amplitude

60. Doctors use waves of a frequency ... .. to break down kidney and ureter stones.

a. more than 20 Hz   b less than 20 KHz
c. 20 Hz   d. more than 20 KHz

61. The produced fruit by grafting belongs to the type of the ... ..

a. scion.   b. cut.   c. stock.   d. bud.

62. The maximum displacement made by the oscillating body away from its original position is ....

a. amplitude.   b. frequency   c period.c time.   d. complete.

63. The distance between two successive troughs or two successive crests in the transverse wave is ....

     a. wavelength   b. amplitude   c. frequency   d. wave velocity

64. Pollination in coloured flowers takes place by ....

     a. insects.   b. man.   c. water.   d. air.

65. The sound velocity is measured in . ... unit.

     a. Hertz   b. m/sec.   c. decibel   d. metre

66. The human skin is considered as a/an .... medium.

     a. transparent   b. opaque   c. translucent   d. no correct answer

67. If the light speed in air is higher than that in another transparent medium, so the refractive index is .

     a. zero   b. 1   c. more than 1   d. less than 1

68. Two gears of Savart's wheel rotate at a same velocity, if the number of teeth of the first gear is 90 teeth and the number of the second is 60 teeth, then the ratio between their frequencies is ....

     a. 1 : 2   b. 3 : 2   c. 2 : 1   d. 5 : 2

69. Artificial vegetative reproduction by cutting can be done in ...

     a. peach.   b. palm.   c. grapes.   d. olive

70. The measuring unit of noise intensity is ....

     a. decibel.   b. Hz.   c. watt/m2   d. metre.

71. All of the following plants reproduce sexually except ....

     a. bean plant.   b. pea plant   c. potato.   d. olive plant.

72. When distance between sound source and the ear is doubled, the sound intensity ..

     a. decrease to its half   b. increases twice.

     c. decreases to its quarter   d. increases four times

73. The male reproductive organ in the flower is .. ...

     a. gynoecium.   b. corolla.   c. calyx.   d. androecium.

74. The light ray refract ... .. the normal when it travels from air to glass.

     a. near to   b. away from   c. perpendicular to   d. along

75. A pencil seems broken when it is placed in a glass cup of water due to .... of light.

     a. critical angle   b. mirage   c. refraction   d. reflection

76. An organ which is responsible for formation of ova in the flower is . . ...

     a. anther   b. ovary.   c. corolla.   d. stamen.

77. Sound wave travels in air with velocity of 340 m/s. and its frequency is 20 Hz. The wavelength of it is .. ..

a   14 cm.   b. 170 cm   c. 170 m.   d. 1700 cm

78. The plant ovary produces ....

a. Pollen grains.   b. ovum.   c. sperms.   d. ovule

79. ....   is a short stem where leaves developed and modified into reproductive organs.

a. Tuber   b. Flower   c. Stock   d. Scion

80. The colorful and scented flower leaves are called

a. sepals.   b. stamens.   c. carpels.   d. petals.

81 The human ear cannot hear sound of frequency

a. 50 Hz.   b. 300 Hz.   c 10 Hz.

82. The male reproductive organ in flower is ....

a. gynoecium.   b. androecium.   c. corolla.

83. The ovum contains   .   of the genetic material of the plant species.

a. half   b. al.   c. quarter

84. The artificial vegetative reproduction is done by ....

a. cutting.   b. grafting.   c. all the previous.

85. Velocity of sound in air equals   m/s

a. 340   b. 1500   c. 3×10^8

86. From artificial vegetative reproduction ... .

a. cutting.   b grafting,   c. tissue culture.   d. (a) , (b) and (c)

87 Calyx consists of a group of green leaves each of them is called   ..

a. sepal.   b. carpel   c. petal   d. micropyle

88. The result of multiplying frequency of an oscillating body by its periodic time equals   ... .

a. one   b negative value.   c constant value.   d variable value.

89 A natural phenomenon takes place on the desert roads at noon due to reflection and refraction of the light   . ...

a. lightning.   b. thunder.   c. mirage.   d. rainbow

90. After fertilization, the ovule develops into ....

a. ovary.   b. fruit.   c. seed.   d. seed coat

91. We can hear all of the following sounds except .

a. 40 Hz.   b. 60 KHz.   c. 10 KHz.   d. 60 Hz

92. Light refraction is due to the difference in   through different media.

   a. sound intensity   b. nature of the surface

   c. light velocity   d. al. the previous answer

93. The absolute refractive index of any material is always . .

   a. more than one.   b. .ess than one.   c. equal to one.   d. equal zero.

94 The zygote contains . . of the genetic material of the plant species.

   a. half   b. all   c. quarter   d. third

95. The artificial vegetative reproduction is done in plants by .. .. ..

   a. cutting   b grafting.   c tissue culture.   d a.l the previous.

96. The flower is a modified ..... .

   a. stem.   b .eaf   c root   d branch

97. The transverse waves consists of ... .

   a. crests and compressions.   c. crests and troughs.

   b. compressions and rarefactions.   d rarefactions and troughs

98 Sound of different musical instruments can be differentiated from each other by ...

   a. harmon'c tones   b. fundamental tone.

   c. sound intensity   d sound pitch.

99. The submerged object in water is seen in an apparent position slightly above its real position due to .. . . of light.

   a. reflection   b. nterference   c diffraction   d. refraction

100. The male genital system consists of vas deferens, penis and . ..

   a- urethra   b- cervix   c- vagina   d- endometrium

✦(3) Complete the following:

1. .... is a transparent medium of light but wood is a(an) .... medium.

2. The ovule inside the ovary is converted into .... after fertilization

3. .... waves are used in breaking the stones of kidneys and ureters

4. Sharp tones have .... frequencies, while rough tones have .... frequencies

5. .... is the male reproductive organ in the plant, while .... is the female reproductive organ in the plant.

6. Harmonic tones are lower in .... and higher in .... than fundamental tones.

7. In transverse wave, the particles of the medium vibrate .... the direction of wave propagation

8. In the flower, the corolla consists of colored leaves, each one is called ....

9. The ratio between the velocity of light through air to the velocity of light through another transparent medium is known as ....

10. The outer whorl of the flower is the .... and it consists of leaves called ....

11. Angle of .... is the angle between the refracted light ray and ....

12. The measuring unit of noise intensity is ...., while the measuring unit of the periodic time is ....

13. The crest in the .... wave is equivalent to the .... in the longitudinal wave.

14. The velocity of the oscillating body reaches its .... value when it passes its rest position.

15. Transverse wave consists of .... and ....

16. When light travels from a medium of .... optical density to another of .... optical density, it refracts far from the normal line

17. Types of pollination are .... and ....

18. Fertilization is process of fusion the male cell nucleus with .... nucleus to form ....

19. If the angle between the incident light ray and the reflecting surface is 25°, so the angle of reflection = ...

20. The frequency of sonic waves ranges between .... Hz to .... KHz.

21. The voice of women is .... pitched, while the voice of men is .... pitched.

22. The cell produced from the fusion of pollen grain with the ovum nucleus is called ....

23. Sound _____ . is the property by which the ear can distinguish between harsh and sharp sounds.

24. Waves are classified according to the ability to propagate and transfer energy into .. _____ .. and .... waves.

25. Complete oscillation consists of .... displacements (amplitudes).

26. Max Planck proved that the energy of light wave consists of energy quanta known as ....

27. The calyx of the flower consists of green leaves called .

28. Stamen consists of anther and . ...

29. Savart's wheel is used to determine the .... of an unknown tone.

30. The stigmas are feathery like and sticky to ....

31. .... is the reflection of light rays when they meet a rough surface.

32. A pencil partially immersed in water appears as being

33. The periodic time of an oscillating body which make 480 oscillations in one minute equals . . .

34. The measuring unit of noise intensity is .... , while ____ . is the measuring unit of the amplitude.

35. After fertilization, the ovary grows forming the .. , while the ovule converted into ..

36. The glass prism is used to analyse the .... light into colors

37. As the amplitude increases, the sound intensity ....

38. Infrasonic waves are sound waves of frequencies less than .... Hz.

39. When a light ray fails perpendicular on a reflecting surface the angle of reflection equals

40. Sound pitches a property by which ear can distinguish between .. and

41. Sound wave velocity _____ . ... λ ..

42. .... motion is the motion which is regularly . ... in equal periods of time.

43. Sound travels through air as pulses of .... and ..

44. In the uniform reflection, the light rays reflect in ____ .. direction when they fall on a ... . surface.

45. The energy of the photon is .... proportional to the .... of the light wave.

46. .... color has the longest wavelength, while .... has the shortest wavelength.

47. If the vertical distance between crest and trough is 4 cm, the amplitude equals ... . cm.

48. .... are transverse waves, while .... waves may be longitudinal or transverse waves

49. Oscillatory motion and .... motion is from .... motion

50. Light intensity is ... . proportional to .... of the distance between the surface and the source.

51. The flower of pumpkins is .... flower, while the flower of tulip is .... flower.

52. When you look at a coin in a glass of water, its .... position appears to be lower than the .... position

53. The maximum displacement done by the oscillating body away from its rest point is called ....

54. Stamen of the flower consists of ....

55. The measuring unit of the frequency is .... but the measuring unit of the noise intensity is ....

56. Pollen grains which spread by wind are produced by .... numbers, and their weight is ....

57. Sounds can be classified into two groups, musical tones of .... frequency and noises of .... frequency

58. The human skin is considered .... medium, while pure glass is .... medium for light

59. The Sound if from .... waves that can't travel through

60. In a flower, the calyx consists of ...., but group of petals form . .. .

61. The high-pitched sound waves have high .... , and small ....

62. There are two types of periodic motion which are .... motion and ....
motion.

63. Light .... is the change of light path when it travels from a transparent medium to another one of different ... ...

64. The light velocity is the distance ....

65. Light travels through the .... media in .... lines

66. Sound waves are longitudinal waves because particles of the medium vibrate .... the direction of wave propagation

67. The light reflection is classified in two types which are ..... and ....

68. From properties of light is that light travels in .... lines.

69. The frequency of the oscillation body is measured by unit called ....

70. The measuring unit of sound intensity is .... while that of noise intensity is

71. The angle of incidence ... . the angle of reflection

72. In the .... waves, the particles of the medium vibrate perpendicular to the direction of wave propagation.

73. The .... are small cells that formed in the anther of the flower.

74. The sound intensity at a point is .... proportional to the square of the distance between this and the source of sound

75. Each carpel consists of a swollen part called ovary which connects with tube called .... and ending in ....

76. The frequency of sonic waves ranges between .... Hz and .... Hz

77. The amplitude equals .... of a complete oscillation

78. Sound is produced from .... of bodies.

79. The natural vegetative reproduction in potatoes is done by ....

80. Frequency of sonic wave, ranges between .... Hz and .... Hz.

81. .... is considered the simplest form of oscillatory motion

82. Calyx of a flower consists of green leaves called .... but corolla consists of colored leaves called ....

83. From the artificial vegetative reproduction in plant are .... and ....

84. If the angle between the incident light ray and reflected light ray is 100°, so the angle of reflection = ...

85. The sound velocity is measured in .... unit while the sound intensity is measured in ....

86. The bisexual flower contains .... and .... , but the male flower contains .... only.

87. In .... reflection, rays are reflected in one direction

88. The complete oscillation include 4 displacements, each one is called ....

89. .... sound wave accompany the blowing of storms before rainfall.

90. After fertilization the ovary of the flower grows forming the ....

✦(4) Correct the underlined words:

1	Sound pitch is increased by **decreasing** the frequency	(. .)
2	A complete oscillation comprises of **two** amplitudes	(.. .. . .)
3	The angle between the incident light ray and the reflected light ray = 100°, so the angle of reflection = **60°**	(.. . .)
4	Reproduction by tubers can be used in **apples**	(.)
5	The human skin is considered as **translucent** medium	(. .)
6	The energy of light quantum is directly proportional to its **wavelength**	(.... . . ..)
7	The big colored flowers are pollinated by **air**	(. .)
8	The crest in the transverse wave is equivalent to the **bottom** in the longitudinal wave	(.)
9	We see the submerged objects in water in a **lower** position than its real position	(. .)
10	Fusion between the pollen grain and the ovum is called **pollination**.	(. . .)
11	Changing the light ray path when it faces a transparent object is considered **light reflection**	(...... ....)
12	The light travels in **curved** lines.	(. . .)
13	The absolute refractive index of any material is always **smaller than one**	(. .)
14	In pollination by **water** the flower has feathery like and sticky stigma	(. .)
15	The movement of the clock pendulum is an example of **wave motion.**	(. . .)
16	The sound intensity **decreases**, when the source of sound touches an empty box .	(.. .. ..)
17	**Yellow** colour is the first colour in spectrum colors	(.. . . . .)
18	Each carpel consists of ovary, **filament** and stigma	( )
19	**Sonic** waves are used in sterilization of milk.	(. ..,. . . ..)
20	If the distance between the first crest and the second crest on the wave propagation is 10 cm, then the wavelength of this wave is **20** cm.	(.)
21	Human ear can distinguish between sound of frequencies ranging between **10** 20000 Hz.	(...... ... .)
22	**Ovule** consists of stigma, style and ovary	(. .)
23	Particles of the medium vibrate along the direction of the wave propagation in the **transverse** wave	(. .)

24	The angle of incident of a light ray is **greater than** the angle of reflection	(................................)
25	**Rainbow** phenomenon takes place on desert roads at noon specially in summer.	(. .)
26	Colored **sepals** attract insects for pollination	(. .)
27	Speed of sound in water is slower than in **air**.	(................................)
28	Reproduction by tubers can be used in **apples and pears.**	(................................)
29	Unit of sound intensity is **Hertz**.	(. .)
30	Harmonic tones companying the fundamental tone lower in **pitch**	( )
31	The wall of the **ovule** after fertilization forms the wall of the fruit.	(................................)
32	Reproduction by **tuber** happens in orange	(................................)
33	When the sound source touches a resonance box, the sound intensity **decreases**	(.)
34	Grafting by **wedge** in which scion is attached to stock.	(. .)
35	**Oscillatory** motion is the motion that is repeated regularly in equal time.	(................................)
36	Light **refraction** is rebounding of light wave in the same medium	(. . .)
37	Sweet potatoes is reproduced by **grafting**.	(.. . . .. .)
38	The sound intensity **decreases** by increasing the density of the medium and vice versa.	(..................................)
39	The result of multiplying the frequency of an oscillating body by its periodic time equals **variable value.**	(.)
40	Angle of **refraction** = angle of reflection.	(.. .. . .)
41	Sugar cane is reproduced by **grafting**	(. .)
42	The wall of the ovary after fertilization form **fruit**	(. .)
43	The produced tone from tuning fork is called **complicated tone.**	(.. . . .. .)
44	The flower which pollination is occurred by **insects** has hanged anther and sticky stigmas	(. . .)
45	**Light** waves used in radars.	(.. . .)
46	Syphilis is caused by a special type of **spherical** bacteria	(.)

✳(5) Give reason for:

1. The periodic time decreases as the number of complete oscillations increases.

    ....

2. The pen seems broken when it is put in a glass of water

    ....

3. The use of ultrasonic waves in milk sterilization

    ....

4. Wood doesn't allow the passage of light through it.

    ....

5. Man sometimes has to pollinate palm trees.

    ....

6. When a light ray is incident perpendicular to the reflecting surface, it reflects on itself.

    ....

7. The waves produced due to vibration of strings are transverse mechanical waves.

    ....

8. Auto pollination can't happen in sunflower.

    ....

9. The energy of red light photon is less than the energy of violet light photon.

    ....

10. Sound waves are mechanical waves while radio waves are electromagnetic waves.

    ....

11. Sound travelling in air has less intensity than that travelling in carbon dioxide.

    ....

12. Man cannot hear all sounds produced by dolphins.

    ....

13. Clear glass is a transparent medium.

    ....

14. Absolute refractive index of any transparent medium is always greater than one.

    ....

15. A light ray transfers from a transparent medium to another and doesn't refract.

16. We see lightning before hearing thunder.

17. The petals of corolla are colorful.

18. To pick up a coin which has fallen in water, we must look at it vertically.

19. The floor of the swimming pool appears higher than its real position.

20. Light can travel through space.

21. Oscillatory motion is considered as a periodic motion.

22. The flower of bean plant is bisexual.

23. Palm plant is unisexual.

24. Sound can be heard from all surrounding directions.

25. The petals of corolla are colored and scented.

26. The stigma of air pollinated flowers are feathery like and sticky.

27. The periodic time decrease as the number of complete oscillation increases.

28. The testes stop their production of testosterone hormone

✱(6) What happen if:

1. The frequency of an oscillating body increases (concerning its periodic time) .

2. The oscillating body passes its rest position during its movement (concerning its velocity).

3. Decreasing the amplitude of the sound source to its half (concerning the sound intensity).

4. A pollen grain falls on a stigma.

5. The frequency of a wave is doubled (concerning the wavelength) when the wave velocity is constant.

6. Incidence of a white light ray on one face of a triangular glass prism.

7. Ovary after fertilization.

8. A light ray travels from a transparent medium of high optical density to another of lower optical density.

9. A light ray falls perpendicular to the interface between two different transparent media.

10. When the distance between the light source and a surface is doubled (concerning the light intensity).

11. When you put a ringing mobile phone on a resonance box (concerning the sound intensity).

12. Incidence of light rays on a rough surface.

    ....

13. Vibration of particles of a medium perpendicularly to the direction of wave propagation.

    ....

14. The stigma of a flower doesn't secrete sugary solution after pollination process

    ....

15. The sound wave travels from solid to water (concerning it's velocity)

    ....

16. The wave length increases to the double value when the wave velocity is constant (concerning the frequency).

    ....

17. A light ray falls perpendicular on a reflecting surface

    ....

18. The distance between the sound source and the ear becomes double (concerning the sound intensity).

    ....

✱(7) Put (√) or (X) :

1. The fish is seen higher than its real position in the fish tank.   (   )

2. The complete oscillation includes four successive amplitudes   (   )

3. The velocity of the oscillating body is maximum when it passes through the original position   (   )

4. Androecium is the female reproductive organ in plant.   (   )

5. Stigma is the male reproductive organ in the flower   (   )

6. The movement of pendulum is an example for wave motion   (   )

7. Bats, dogs and dolphins can hear ultrasonic waves   (   )

8. The sound intensity decreases, when the source of sound touches an empty box   (   )

9. The light ray refracts towards the normal when it travels from air to glass   (   )

10. The velocity of the oscillating body is minimum when it passes its rest position   (   )

11. The corolla is the male reproductive organ in the flower   (   )

12. Infrasonic waves are used in breaking down stones of kidney   (   )

13. Sound can be heard from all directions that surround the sound source   (   )

14. Harmonic tones that accompany the fundamental tone are lower in pitch   (   )

15. Reproduction by tubers can be used in apples and pears.   (   )

16. Wood doesn't allow the passage of light through it.   (   )

17. The measuring unit of sound intensity is decibel.   (   )

18. Sound velocity through liquids is more than that through gases   (   )

19. The pollen grains of the air pollinated flowers are sticky and have coarse surface. (   )

20. If the angle between the incident light ray and the reflecting surface is 40°, so the angle of reflection equals 40° according to the first law of light reflection.   (   )

21. The pendulum motion is an example of wave motion.   (   )

22. The typical flower contains three whorls   (   )

23. Drd is an example of the musical tones.   (   )

24. The energy of light = Constant x Wavelength.   (   )

25. Androecium in the flower is responsible for producing pollen grains   (   )

26. The particles of the medium vibrate along the direction of the wave propagation in longitudinal wave   (   )

27. The sound intensity deceases when it touches a resonance box ( )

28. The swing is an example of periodic motion ( )

29. The typical flower contains three whorls. ( )

30. Light waves are electromagnetic transverse wave. ( )

31. Sound intensity increase as amplitude increase. ( )

32. Sound can be heard from all directions that surround the sound source ( )

33. Sound intensity increases when wind and sound waves are in the same direction ( )

34. The absolute refractive index for any transparent medium is less than 1 ( )

35. From ways of artificial vegetative reproduction are cutting, grafting and tubers ( )

36. The sound velocity through solids is less than that through liquids ( )

37. Sonic waves are used in sterilizing food substances. ( )

38. The wall of ovary after pollination forms the coat of the fruit. ( )

39. The sound intensity increases as the amplitude increases. ( )

40. Reproduction by tuber happens in orange and bitter orange ( )

41. The transverse wave consists of compressions and troughs. ( )

✱(8) What is meant by Define .... ?

1. Complete oscillation.

2. Ultrasonic waves.

3. The inverse square law of light.

4. Sound pitch.

5. Flower.

6. Sonic waves.

7. Light intensity.

8. Periodic time.

9. Fertilization in plant.

10. Light refraction.

11. Absolute refractive index of water is 1.33

12. The wavelength of a sound wave is 1.5 m.

13. Regular reflection of light.

14. Angle of incidence of a light ray   30°

15. Mixed pollination.

16. Harmonic tones.

17. Speed of light.

18. Amplitude.

19. Sound intensity

20. First law of reflection.

21. The angle of reflection of a light ray equals 45°

22. The wave.

23. Light reflection.

24. Periodic motion

25. Pollination.

26. The amplitude of an oscillating body is 3 cm.

✱(9) Problems

1

In the opposite figure :

1. Mention the name of parts (X) and (Y)

2 What is the function of part (Y) ?

3 Identify the sex of this flower.
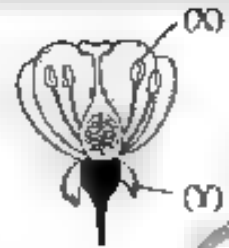
2

Calculate the frequency of a musical tone similar to the tone produced from Savart's wheel rotating with a velocity of 960 cycles in two minutes, knowing that the number of gear teeth= 30 teeth.

3

From the opposite figure, answer :

1. The ray (AB) represents ...

2. The ray (BC) represents ...

3. Angle (X) is ....

4. Angle (Y) is ...
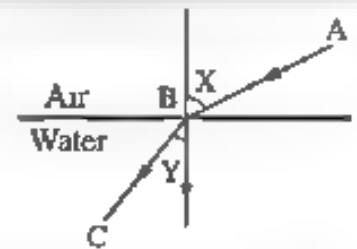
4

From the opposite figure :

1 Calculate the angles of incidence and reflection.

2 What can you conclude from this figure ?

3 What will happen if this light ray falls perpendicular on the reflecting surface ?
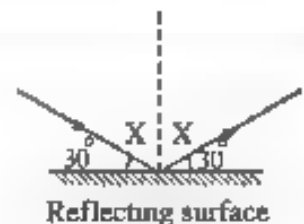
5

Label the figure :

① _____
② _____
③ _____
④ _____

②   ①   ③   ④

6
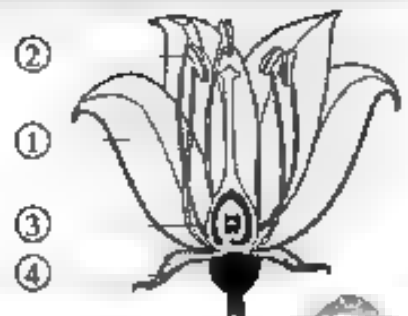
From the opposite figure, calculate :

1. Wavelength.
2. Frequency
3. Amplitude.
4. Periodic time
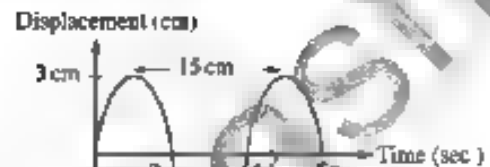
7

Complete the opposite figures after redrawing
them in your answer sheet then complete
the following statements :

1. In fig (1) the angle of reflection =
2. In fig (2) the angle of incidence = ____
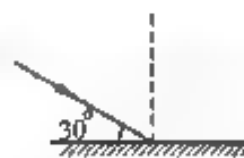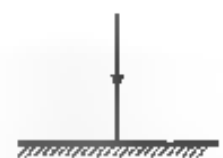
30

Fig. (1)   Fig. (2)

8

savart's wheel rotates with a rate of 300 cycles per minute. A sound of frequency 600
Hz is produced when an elastic plate touches the teeth of the gear, calculate the
number of teeth of the gear.

9

The opposite figure represents an oscillatory
motion for a simple pendulum. Choose the
letter that denotes :
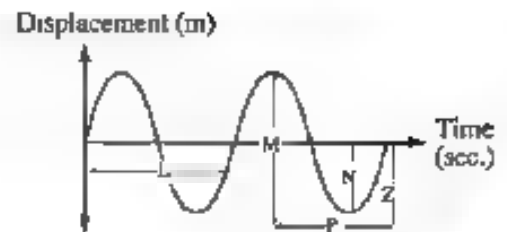
1. The oscillation of the pendulum
forming $\frac{3}{4}$ complete oscillation.

2. The amplitude.

Displacement (m)

10

Calculate the number of gear teeth of Savart's wheel, if a musical tone similar to the
frequency of an emitted tone = 160 Hz, and Savart's wheel rotated with a velocity of
960 cycles in three minutes.

11

From the opposite figure, find :

1. Wavelength.
2. Frequency.
3. Amplitude.
4. Wave velocity.

Displacement (m)
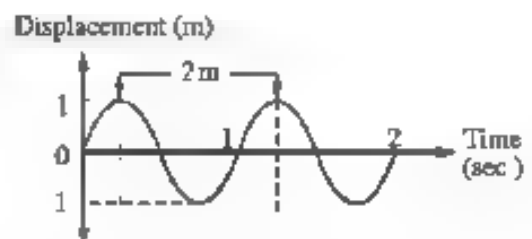
12

The opposite figure represents a torch emits light falls on a mirror :

1. Torch ...... represents the following reflection.

2. The angle between the reflected light ray
and its incident light ray = ...

3. Identify the second law of reflection of light.

Mirror
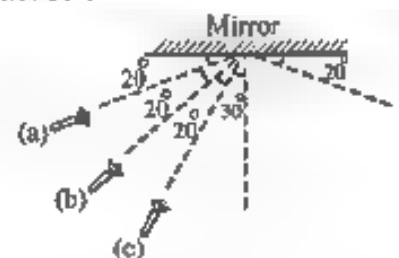
13

From the opposite figure, calculate :

1 Frequency

2 Wavelength.

3 Velocity of the wave

Displacement (m)

60m

0.04 sec

Time (sec.)
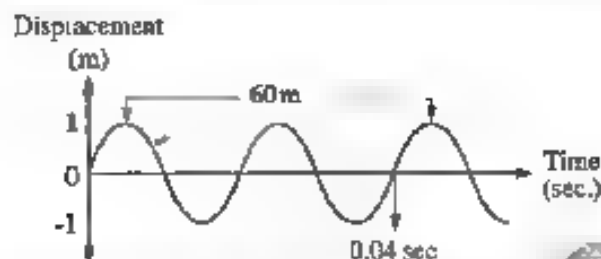
14

(1)

1. What is the kind of the produced wave ?

2 Label points (A) and (B).

3. What's the name of the distance between (C) and (D) ?

4. The arrow (Z) refers to the

(2)

(A)   (B)
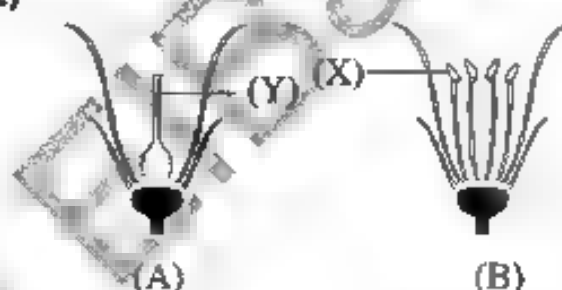
1. What is the name of parts (X) and (Y) ?

2. Mention the function of part (X).

3. What is the sex of flowers (A) and (B) ?

15

From the opposite figure, find :

1 Wavelength.

2. Frequency.

3 Amplitude.

4. Wave velocity.

Displacement (m)

4m

Time (sec)

0.2sec.
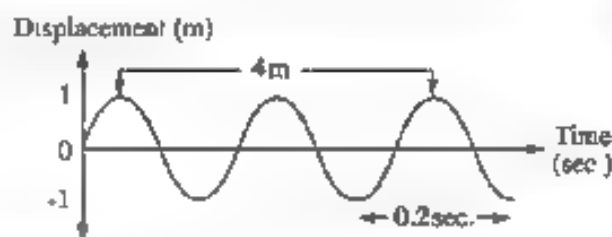
16

From the opposite figure, calculate the following :

1. Amplitude.
2. Periodic time.
3. Frequency.

t=2 sec.

5 cm
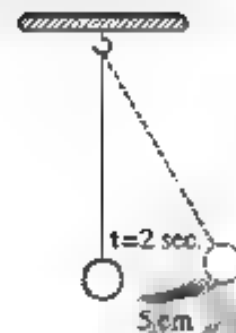
17

From the opposite figure, find the number that refers to the following :

1. The angle of incidence
2. The angle of refraction.
3 Which medium (A) or (B) is greater in the optical density ?

(A)

(B)
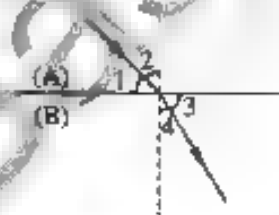
18

Complete the labels on the figure, and mention :

1. The sex of the flower.

2. Its symbol

3. The way of reproduction
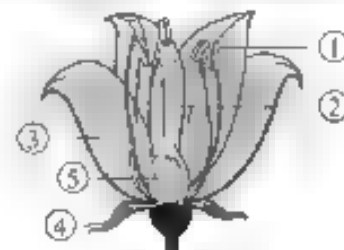
Model Answer

● (1) Write the scientific term:

1. Infrasonic waves
2. Amplitude
3. Cross-pollination
4. Decibel
5. Typical flower
6. Optical density of medium
7. Bisexual
8. Wave motion
9. Complete oscillation
10. Sound
11. Pollination
12. Savart wheel
13. Calyx
14. Zygote
15. Irregular reflection
16. Light intensity
17. Sound pitch
18. Periodic time
19. Crest
20. Watt/m²
21. Frequency
22. Mirage
23. Light refraction
24. Longitudinal waves
25. Angle of emergence
26. First law
27. Oscillatory motion
28. Mechanical waves
29. Sound intensity
30. Light reflection
31. Angle of incidence
32. Typical flower
33. Rarefaction
34. Opaque object
35. Tissue culture
36. Corolla
37. Period of time
38. Sonic waves
39. Inverse square law of sound
40. Max blank
41. Optical density of medium
42. Fertilization
43. Wave
44. Compression
45. Wave velocity
46. Photon energy
47. Tissue culture
48. Absolute refractive index
49. Transverse waves
50. Flower
51. Mechanical waves
52. Irregular reflection
53. Mirage
54. Sound quality
55. Periodic motion
56. Angle of reflection
57. Optical density of medium
58. Frequency
59. Ultrasonic waves
60. Second law
61. Savart wheel
62. decibel
63. Infrasonic
64. Testosterone

●(2) Choose the right answer:

#	Ans	#	Ans	#	Ans	#	Ans	#	Ans	#	Ans	#	Ans	#	Ans
1	B	14	A	27	C	40	B	53	B	66	B	79	B	92	C
2	A	15	B	28	A	41	C	54	C	67	C	80	D	93	A
3	B	16	C	29	C	42	A	55	A	68	B	81	C	94	B
4	A	17	A	30	C	43	D	56	A	69	A	82	B	95	D
5	B	18	B	31	A	44	C	57	C	70	A	83	A	96	A
6	A	19	C	32	C	45	B	58	C	71	C	84	C	97	C
7	C	20	C	33	C	46	C	59	A	72	C	85	A	98	A
8	B	21	B	34	C	47	C	60	B	73	D	86	D	99	D
9	C	22	D	35	D	48	A	61	B	74	A	87	A	100	A
10	D	23	C	36	D	49	B	62	A	75	C	88	A		
11	B	24	C	37	C	50	B	63	A	76	B	89	C		
12	D	25	B	38	B	51	C	64	A	77	D	90	C		
13	A	26	A	39	C	52	C	65	B	78	D	91	B		

●(3) Complete the following:

1. Glass opaque
2. Seed
3. Ultrasonic
4. High low
5. Androecium gynoecium
6. Intensity pitch
7. Perpendicular
8. Petal
9. Absolute refractive index
10. Calyx sepals
11. Refraction normal
12. Decibel
13. Transverse compression
14. Max blank
15. Crest trough
16. Higher lower
17. Self cross
18. Female – zygote
19. 65
20. 20 20
21. High low
22. Zygote
23. Patch
24. Electromagnetic mechanical
25. Four
26. Photons
27. Sepal
28. Filament
29. Frequency
30. Catch pollen grains
31. Irregular
32. Brocken
33. 0.25
34. Decibel meter
35. Fruit seed
36. White seven
37. Increase
38. 20
39. Zero
40. Sharp harsh
41. Frequency x wavelength
42. Periodic repeated
43. Compression rarefaction
44. One smooth
45. Directly frequency
46. Red violet
47. 8
48. Electromagnetic mechanical
49. Wave periodic
50. Directly square
51. Unisexual bisexual
52. Real apparent
53. Amplitude
54. Anther filament
55. Hertz decibel
56. Huge light
57. Uniform non uniform
58. Opaque transparent
59. Mechanical vacuum
60. Sepal – corolla
61. Frequency amplitude
62. Oscillatory wave
63. Refraction density
64. Covered by light in one second
65. Transparent straight
66. Along
67. Regular irregular
68. Straight
69. Hertz
70. Watt/m²
71. Equals
72. Transverse
73. Pollen grains
74. Inversely
75. Style - stigma
76. 20 20000
77. Quarter
78. Vibration
79. Tubers
80. 20 20000
81. Simple harmonic motion
82. Sepal petal
83. Cutting - grafting
84. 50
85. m/sec Watt/m²
86. Androecium gynoecium
87. Regular
88. Amplitude
89. Infrasonic
90. Fruit

✱(4) Correct the underlined words:

1. Increase	11. Light refraction	20. 10	29. Watt/m²	41. Cutting
2. Four	12. Straight	21. 20	30. intensity	42. Pericarp
3. 50	13. More	22. Carpel	31. Ovary	43. Fundamental tones
4. Potatoes	14. Air	23. Longitudinal	32. Grafting	44. Wind
5. Opaque	15. Oscillatory	24. Equal	33. Increase	45. Radio
6. Frequency	16. Increase	25. Mirage	34. Attachment	46. Spiral
7. Insects	17. Red	26. Petals	35. Periodic	
8. Compression	18. Style	27. Solid	36. Reflection	
9. Higher	19. Ultrasonic	28. Potatoes and sweet potatoes	37. Tuber	
10. Fertilization			38. Increase	
			39. One	
			40. Incident	

✱(5) Give reason for:

1. Because the number of complete oscillations is inversely proportional to the periodic time

2. Due to the refraction of light rays coming from the immersed part in water, where the eye sees the immersed part of the pencil on the extensions of these refracted rays

3. Because they have high ability to kill some types of bacteria and stop the action of some viruses

4. Because it is an opaque medium.

5. To ensure the pollination process, as pollination is difficult to occur by insects or by air

6. Because angle of incidence= angle of reflection= zero

7. They are transverse because the medium particles vibrate perpendicular to the direction of wave propagation forming crests and troughs and mechanical because they need a medium to propagate through

8. Because their anthers and stigmas are not maturated at the same time

9. Because the frequency of red light photon is less than that of orange light photon

10. Because sound waves need a medium to propagate through, while radio waves don't need a medium to propagate through

11. Because the density of carbon dioxide gas is more than that of air, since sound intensity is directly proportional to the density of the medium

12. Because dolphins produce ultrasonic waves, while the human ears can't hear sounds of frequencies more than 20 kilohertz

13. Because clear glass permits most light to pass through and objects can be seen clearly through it

14. Because the velocity of light through air is always greater than that through any other transparent medium

15. Because the angle of incidence= zero

16. Because the velocity of light waves of lightning (electromagnetic waves) is much greater than that of sound waves of thunder (mechanical waves)

17. To attract insects to the flower which help in the sexual reproduction process

18. Because the ray which falls perpendicular to the interface passes to air without refraction, so the apparent position is the real position

19. Due to light refraction

20. Because it is electromagnetic waves which don't need a medium to travel through.

21. Because it is repeated regularly in equal periods of time

22. Because its flower contains four whorls.

23. Because the flowers contain only male or female reproductive organ

24. Because sound travels through air as spheres of compressions and rarefactions whose center is the sound source

25. To attract insects to the flower which help in the sexual reproduction process

26. To catch pollen grains from air

27. Because the number of complete oscillations is inversely proportional to the periodic time

28. the male doesn't reach to the puberty

*(6) What happen if:

1. The periodic time will decrease
2. Its velocity increases to the maximum value
3. Sound intensity will decrease
4. It will germinate fanning a pollen tube
5. The wavelength decreases to its half value
6. The white light analysis into seven colours
7. The ovary will grow to become a fruit.
8. It will refract
9. It will pass without refraction
10. The light intensity decreases to its quarter
11. The intensity of the produced tone increases.
12. The light rays are reflected in many directions
13. Transverse waves are formed
14. The pollen grain will not stick on stigma, and then pollen grain will not germinate
15. Sound velocity will decrease since velocity of sound through solids is higher than the velocity of sound through liquids
16. The frequency will decrease to half since $(v = F \times \lambda)$
17. The light ray will reflect on itself
18. The sound intensity will decrease to its quarter

*(7) Put (√) or (X) :
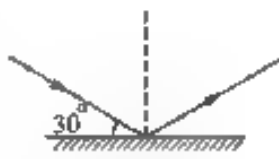
1. (√)	10. (X)	19. (X	28. ( )	37. (X
2. (√)	11. (X)	20. (X	29. (X)	38. (√
3. (√)	12. (X)	21. (X)	30. (√)	39. (√
4. (X)	13. (√)	22. (X	31. (√)	40. (X
5. (X)	14. (X)	23. (X	32. (√)	41. (X
6. (X)	15. (X)	24. (X	33. (√)	
7. (√)	16. (√)	25. (√	34. (X)	
8. (X)	17. (X)	26. (√	35. (√)	
9. (√)	18. (√)	27. (√)	36. (X)	

*(8) What is meant by Define .... ?

1. It is the motion of an oscillating body when it passes by a fixed point on its path two successive times in the same direction

2. They are sound waves of frequencies higher than 20000 Hz (20 KHz).

3. The light intensity of a surface is inversely proportional to the square of the distance between the surface and the source of light

4. It is the property by which the ear can distinguish (differentiate) between harsh and sharp voices

5. It is a short stem whose leaves are modified into reproductive organs.

6. They are sound waves of frequencies ranging from 20 Hz to 20 k z

7. It is the quantity of Light falling perpendicular to a unit area of a surface in one second

8. It is the time taken by an oscillating body to make one complete oscillation

9. It is the process of fusion of the nucleus of male cell (pollen grain) with the nucleus of female cell (ovum) to form the zygote.

10. It is the change of light path when it travels from a transparent medium to another transparent medium of different optical density

11. The ratio between the velocity of light through air to that through water is 1.33

12. The distance between the centers of two successive compressions or two successive rarefactions is 5 m

13. It is the reflection of light rays when they meet (fall on) a smooth uniform and glistening reflecting surface, where the incident light rays are reflected

14. The angle between the incident light ray and the line perpendicular to the reflecting surface at the point of incidence is 30 °

15. It is the transfer of pollen grains from the anthers of a flower to the stigmas of another flower on other plant of the same kind

16. They are tones that accompany the fundamental (basic) tone but they are higher in pitch and lower in intensity and differ from one instrument to another

17. It is the distance which is covered by light in one second

18. It is the maximum displacement done by the oscillating body away from its rest position.

19. It is the property by which the ear can distinguish (differentiate) between either strong and weak sounds.

20. Angle of incidence = Angle of reflection

21. The angle between the reflected light ray and the line perpendicular to the reflecting surface at the point of incidence = 45 °

22. It is the disturbance that propagates and transfers energy in the direction of propagation

23. It is the rebounding of light waves in the same medium on meeting a reflecting surface

24. It's a motion which is regularly repeated in equal periods of time

25. It is the process of transfer of pollen grains from the flower anthers to the stigmas

26. The maximum displacement done by the oscillating body away from its rest position is 3 cm 0.03 m.

✺(9) Problems

1	1. Part (X) . Anther Part (Y) : Sepal 2. It protects the inner parts of the flower specially before blooming. 3. Bisexual (hermaphrodite) flower	**7**	 Fig (1)　　　　　Fig. (2) 1. 60°　　　　　　2. zero

2 Sound frequency (F)

$$= \frac{\text{Number of cycles (d)} \times \text{Number of gear teeth (n)}}{\text{Time in seconds (t)}}$$

$$= \frac{960 \times 30}{120} = 240 \text{ Hz}.$$

3
1. incident ray.　　　　　2. refracted ray.
3. angle of incidence.
4. angle of refraction.

8 Sound frequency (F) =

$$\frac{\text{Number of cycles (d)} \times \text{Number of gear teeth (n)}}{\text{Time in seconds (t)}}$$

$$600 = \frac{300 \times \text{Number of gear teeth}}{60}$$

Number of gear teeth $= \frac{600 \times 60}{300} = 120$ teeth.

9　1 P　　　　　　2. N

10 Sound frequency (F) =

$$\frac{\text{Number of cycles (d)} \times \text{Number of gear teeth (n)}}{\text{Time in seconds (t)}}$$

$$160 = \frac{960 \times \text{Number of gear teeth}}{180}$$

Number of gear teeth $= \frac{160 \times 180}{960} = 30$ teeth.

4
1. Angle of incidence = 90° − 30° = 60°
   Angle of reflection = 90° − 30° = 60°
2. Angle of incidence = Angle of reflection
3. It will reflect on itself.

11
1. Wavelength = 2 m.
2. Frequency = $\frac{\text{Number of complete oscillations}}{\text{Time in seconds}}$
   $= \frac{2}{2} = 1$ Hz
3. Amplitude = 1 m
4. Wave velocity = Wavelength × Frequency
   $= 2 \times 1 = 2$ m/sec

5
① Petal　　　　　　② Anther
③ Ovary　　　　　　④ Sepal

6
1. Wavelength = 15 cm = 0.15 m.
2. Frequency $\frac{1}{4} = 0.25$ Hz
3. Amplitude = 3 cm = 0.03 m.
4. Periodic time $= \frac{1}{0.25} = 4$ sec

12
1. (a)　　　　　　2. 140°
3. The incident light ray, the reflected light ray and the normal to the surface of reflection at the point of incidence, all locate in one plane perpendicular to the reflecting surface.

13	1 Frequency = $\frac{2}{0.04}$ = 50 Hz.	16	1. Amplitude = 5 cm = 0.05 m.
			2. Periodic time = 4 × 2 = 8 sec.
	2 Wavelength = $\frac{60}{2}$ = 30 m		3 Frequency = $\frac{1}{\text{Periodic time}}$ = $\frac{1}{8}$
	3 Wave velocity = Frequency × Wavelength		= 0.125 Hz.
	= 50 × 30 = 1500 m/sec		
14	(1) 1. Longitudinal wave	17	2 2. 4 3. Medium (B)
	2. (A) Rarefaction		
	(B) Compression		
	3. The wavelength		
	4. direction of wave propagation		
	(2) 1. (X) Anther.	18	1 Fertilization. 2. The wave
	(Y) Style.		3. The compression.
	2. It produces and holds pollen grains		4. The flower. Infrasonic waves.
	3 Flower (A) is a female flower		6. Optical density of the medium
	- Flower (B) is a male flower		7. Vegetative reproduction.
15	1 Wavelength = $\frac{4}{2}$ = 2 m		
	2 Periodic time = 2 × 0.2 = 0.4 sec		
	Frequency = $\frac{1}{\text{Periodic time}}$ = $\frac{1}{0.4}$ = 2.5 Hz.		
	3 Amplitude = 1 m		
	4 Wave velocity = Wavelength × Frequency		
	= 2 × 2.5 = 5 m/sec		

1) Complete the following statements:

1. The outer whorl of the flower is called ...., each leaf is called ....

2. The male reproductive organ in flower is...., while the female reproductive organ in flower is ....

3. The ....hormone in male and ....hormone in female are responsible for the appearance of secondary sex characters.

4. Fertilization is the process of fusing the male cell nucleus (pollen grains) with Nucleus to form ....

5. The egg contains.................. of genetic material of the plant species, while zygote contain .... of genetic material of the plant species.

6. ....glands an ..... gland are from glands associated with male genital system.

7. .... and .... are female sex hormone.

8. After fertilization, the ovary grows forming ......while the ovule converts into ...

9. Each stamen consists of .... and ....

10. The calyx is a group of ....leaves, each leaf is called ....

11. The sperm and ovum are fused together to form .... which carries pairs of chromosomes.

12. Each ovary produces on ovum every days in exchange with the other ovary.

13. Calyx consists of green leaves called .. , but corolla consists of colored leaves called...................

14. From the artificial vegetative reproduction in plants are.................. , ... and ....

15. The testis function is to produce .... and secrete the ..... hormone.

16. The bisexual flower contains .... and ....

17. The human zygote results from the fusion of .... and ....

18. The sperm consists of ...., middle part and ....

19 ...... differ according to the nature of the ovary either contain one or more ova.

20. The vas deferens transports .... from.............. To urethra.

21. Sweet potatoes is considered as ...., while the potatoes are   and reproduction of them is done by ....

22. Sharp tones have ...., while rough tones have ....frequencies.

23. The measuring unit of sound intensity is...   , while the measuring unit of noise intensity is..................

24. The distance covered by light in one second is called....................

25. Frequency of sonic waves ranges between   Hz and Hz

26. The reflection is classified into two types which are .... and ....

27. Sound intensity is the property by which the ear can distinguish between .... and .... sounds

28. Sound pitch is the property by which the ear can distinguish between .... and .... sounds

29. From the factors affecting sound intensity are .... and ....

30. If the angle between the reflected ray and the perpendicular to the reflecting surface is 40°, the incidence angle is......................

31. A sound wave travels in air with velocity 330 m/s and has a wavelength of 0.5 m, its frequency is......................

32. Angle of .... is the angle between the refracted light ray and the ...... at the point of incidence on the separating surface.

33. The sound is considered from .. waves , because it needs a medium

34. When you look at a coin in a glass of water, its position appears to be lower than .... Position.

35. Sound intensity at certain point is ..... proportional to the square of the distance between

this point and the sound source, and is .... proportional to the square of the amplitude.

36. The ratio between light speed in air and light speed in a medium is called of a medium.

37. From the natural phenomenon that are related to the reflection and refraction of light are........................... and ....

38. A pencil partially immersed in water appears as being...................

39. If the angle between the incident light ray and the reflecting surface is 25°, so the angle of reflection = ...

40. As amplitude increases, the sound intensity ....

41. Savart's wheel is used to determine....................

42. Hertz is the unit which measures the   of the oscillating body.

43. .... is the measuring unit of frequency, while   is the measuring unit of amplitude.

44. The result of multiplying the frequency by periodic time equals...........

45. Transverse wave consists of.................. and ....

46. Longitudinal wave consists of...................and....................

47. The complete oscillation contain successive displacements.

48. If the periodic time of an oscillating body is 0.1 sec., so the number of complete oscillations in one minute is ....

49. Waves are classified according to the ability to propagate and transfer energy into.........................and ....

50. travels in air with velocity 340 m/s

51. The periodic motion is the motion which is regularly repeated in equal................

52. Is considered the simplest form of oscillatory motion.

53. The sound is considered from... waves, because it needs a medium.

54. When an oscillating body makes 500 complete oscillations in a time = 2 minutes, its periodic time equals...................

1. Short stem where the leaves are developed and modified into reproductive organs.................

3) The outer whorl of floral leaves which consists of a group of green sepals.......

4) A flower that contains androecium and gynoecium...........

5) Leaves of floral whorl that consists of fine filament ending by a sac........

6) It is the pollination carried out by man.................

7) A hormone produced by the testis

8) A floral whorl in the flower, its function is to attract insects.

9) A sac-like structure that regulates and keeps the temperature of testis 2 degrees below the normal body temperature.

10) The cell resulting from the fusion of pollen grains and ovum nucleus.

11) The transfer of pollen grains from the anthers of a flower to the stigma of another flower on another plant.

12) The fusion of the male cell (pollen grain) with female cell (ovum).

13) The female reproductive organ in flower.

14) A flower that contains androecium only.

15) A group of glands their function is to secrete semen.

16) The reproduction of some plants by parts of the roots, stem or leaves.

17) A new method of producing large numbers of plants from a small part of it.

18) The process of multiplying a small part of plant to get many identical parts.

19) 18. A tube with funnel shaped opening transports the ovum to the uterus.

20) 19. The genetic material which carries genes those are responsible for the hereditary traits of the organisms.

21) 20. A cell, which its nucleus contain 23 pairs of chromosomes resulting from the fusion of sperm and ovum.

22) The changing of light ray path when moving from a transparent medium to another transparent medium.

23) They are sound waves of frequency less than 20 Hz.

24) The distance covered by light in one second.

25) 24. A property by which the ear can distinguish between sharp and rough sounds.

26) 25. A property by which the ear can distinguish between strong and weak sounds.

27) 26. The ability of the medium to refract light.

28) 27. A phenomenon that appears in the desert as a result of reflection.

29) It is an external factor that affects the ear causing the sense of hearing.

30) They are tones that accompany the fundamental tone, but they are lower in frequency and higher in pitch.

31) 30. A type of reflection takes place on a dirty plan mirror.

32) The angle of incidence = the angle of reflection.

33) An angle between the refracted light ray and the normal at the point of incidence at the interface.

34) The sound intensity is inversely proportional to square of the distance between the surface and sound source.

35) The angle between the refracted light ray and the normal at the incidence point.

36) The reciprocal of the frequency.

37) The maximum displacement done by the oscillating body away from its original position.

38) The number of complete oscillations produced by the oscillating body in one second.

39) The time taken by the oscillating body to make one complete oscillation.

40) The direction through which the wave propagates.

41) The motion which is regularly repeated in equal periods of time.

42) The motion of the oscillating body around its rest position.

43) The area in the longitudinal wave at which the medium particles are away from each other.

44) The highest point in the transverse wave.

3) Choose the correct answer:

1. Pollen grains are produced in.............
   a. stigma   b. fi.ament   c. anther   d ovary

2. The floral leaves of typical flower are arranged in floral leaves.
   a two   b three   c. five   d four

3. The flower is a modified ....
   a stem   b leaf   c. root

4. The zygote contain ....of the genetic material of egg cell.
   a ha f   b. all   c. quarter

5. **The bisexual flower contains ....**

   a only androecium   b only gynoecium   c androecium and gynoecium

6. **After fertilization, the ovary grows forming ....**

   a seed   b fruit   c flower

7. **The green leaves surrounding the flower are...................**

   a carpels   b stamens   c petals d. sepals

8. **Fertilization is the process of fusion of male and female cells to form ....**

   a. zygote   b. sperm   c. ovum   d pollen grain

9. **The floral whorl which is not found in the female flower is ....**

   a. calyx   b. androecium   c. corolla   d gynoecium

10. **A mobile cell of a relatively small size in human is called ....**

    a sperm   b. ovum   c ovule   d pollen grain

11. **...................occur when zygote is formed**

    a embryo   b. fertilization   c. pollen grain   d ovum

12. **All the following are parts of male reproductive system except...................**

    a vas deferens   b. uterus   c. testis   d Cowper's gland

13. **All the following methods are examples for artificial vegetative reproduction except...................**

    a cutting   b bulbs   c grafting   d tissue culture

14. **All of the factors affecting sound intensity except...................**

    a amplitude   b frequency   c medium density   d wind direction

15. **The angle between the incident light ray and the reflected light ray is 40°, so the angle of reflection is ....**

    a 20°   b. 40°   c. 80°   d 90°

16. **The number of teeth gear in savart's wheel increase, the   of the produced sound increase**

   a amplitude   b intensity   c frequency   d quality

17. **From the natural phenomenon that resulted from reflection of light is**

   ....

   • echo   b mirage   c seeing objects higher than normal position

18. **. The human ear can hear sound of frequency......................**

   a 300 Hz   b. 30 KHz   c. 50 KHz

19. **If the angle between the incident light ray and the reflecting surface = 40°, so the angle of reflection of light = ...**

   a 30°   b. 40°   c 50°   d 60°

20. **. The sound of frequency 200 Hz is   than the sound of frequency 100 Hz**

   a stronger   b. sharper   c. weaker   d harsher

21. **The amplitude of the harmonic tone is   that of fundamental tone.**

   a smaller than   b arger than   c. equal to   d (a) and (b) are correct

22. **The doctors use waves which have frequency   to break down kidney and intens stones**

   b. less than 20 Hz   b 20 Hz   c. more than 20 KHz

23. **When a light ray passes from glass to air, it refracts   to the normal.**

   a near to   b. away from   c perpendicular to

24. **If the distance between sound source and the ear increases 3 times, so intensity of sound............**

   a. decreases $\frac{1}{2}$ b. increases 3 times   c. decreases to   d decreases to

25. **All the following are examples of the oscillatory motion except................**

    swing   b spring   c, rotary bee   d, tuning fork

26 ....is (are) mechanical waves.

    a water waves only   b, sound waves on y   c, both (a) and (b)

27 **All the following are electromagnetic waves except..................**

    a light   b. sound   c, x-ray   d. radio

28. **The periodic time of an oscillating body which makes 240 oscillations in one minute = ...**

    a 1 sec   b. 0.25 sec.   c. 0.5 sec.   d 4 sec

4) Correct the underlined word:

1. The <u>stamen</u> consists of stigma, style and ovary.

2. The <u>corolla</u> is the male reproductive organ in the flower

3. <u>Ovaries</u> produce sperm and male hormone.

4. The egg contains <u>quarter</u> of the genital material of plant species.

5. Palm trees are pollinated by <u>air</u>.

6. The two glands that lie outside the body in sacrotal sac are called two <u>anthers</u>.

7. From type of reproduction are sexual and <u>bisexual</u>.

8. The <u>estrogen</u> hormones are responsible for pregnancy take place and continue.

9. In pollination by <u>water</u>, the flower has feathery like and sticky.

10. The <u>rose</u> is a group of flowers arranged on the same axle.

11. <u>Ovule</u> consists of stigma, style and ovary.

12. The <u>ovum</u> is a mobile cell, of a relatively small size.

13. The <u>ovaries</u> are adapted to receive the ovum and deliver it to the uterus.

14. Sugar can is reproduced by <u>grafting</u>.

15. Penis transfers the sperms from the testis to the urethra.

16. The angle of incidence light ray is greater than angle of reflection.

17. The sound velocity through liquids is less than that through gases.

18. Human ear can distinguish sounds of frequency ranging between 10: 20000 Hz.

19. Infrasonic waves can be used to determine industrial defects.

20. Angle of refraction = angle of reflection

21. Particles of the medium vibrate along the direction of the wave propagation in the transversewave.

5) What happens when?

1) Pollen grain falls on the stigma of a flower.

2) If there is no seminal fluid in male.

3) The middle part (mid-piece) of a sperm is damaged.

4) Ovaries of the human female are not secreting the progesterone hormone.

5) The stigma of a flower doesn't secrete sugary solution after pollination process.

6) Incidence of light rays on a rough surface.

7) The sound wave travels from solid to water (concerning it's velocity)

8) The wave length increases to the double value when the wave velocity is constant (concerning the frequency).

9) A light ray falls perpendicular on a reflecting surface.

10) Light rays falls perpendicular to the interface between different transparent media of different optical densities.

11) The distance between the sound source and the ear becomes double (concerning the sound intensity).

....

12)   The oscillating body passes its rest position during its movement (concerning its velocity).

....

13) The oscillating body reaches the position of its maximum displacement during its movement (concerning its kinetic energy).

....

14)   A light ray travels from a more optically dense medium like glass to less optically dense as air.

....

6) What is meant by?

1) Pollination in flowers...
2) Self pollination...
3) Cross pollination in plants...
4) Artificial pollination..
5) Fertilization in flower...
6) Zygote..
7) Hermaphrodite flower..
8) Tissue culture...
9) Sound pitch...
10)   Sound intensity..
11)   Sonic waves...
12)   The absolute refractive index of water is 1.33...
13)   Mirage...
14)   Angle of emergence...
15)   Light reflection...
16)   Light refraction..
17)   Optical density...
18)   The oscillatory motion...
19)   The wave..
20)   The oscillating body makes 200 oscillations in 2 minutes.........................
21)   The wavelength of a sound wave is 30 cm...

1) Calyx..

2) Epididymis..

3) Gynoecium..

4) The corolla...

5) Anthers of flowers...

6) Ovary in female human...

7) Fallopian tubes...

8) Testis...

9) The sacrotal sac..

10) Head of sperm...

11) Midi-piece of sperm...

12) Testosterone hormone..

13) Estrogen hormone...

14) Progesterone hormone..

15) Prostate, seminal vesicles and Cowper's glands..

16) Ultrasonic waves...

17) Jacuzzi (physiotherapy tubes)..

18) Radio waves..

1) The petal of corolla is colorful and scented?

2) The fallopian tubes are lined with cilia?

3) The presence of the testis in human male outside the body in the sacrotal sac?

4) Palm flowers are unisexual?

5) Flowers pollinated by insects produce coarse pollen grains?

6) Hearing thunder after seeing lightning although they both happen at the same time?

7) Auto pollination happens in barley plant, while can't happen in sunflowers?

8) The sperm has a long and a thin tail?

9) The uterus is lined with mucus membrane rich in blood capillaries?

10) The uterus is a suitable organ for the growth of embryo?

11) Peach fruit contains only one seed?

12) The seminal fluid is alkaline?

13) When a light ray is incident perpendicular to a reflecting surface, it reflects on itself?

14) The floor of a swimming pool appears higher than its real position?

15) 15. A pencil in a glass of water appears broken?

16) Sound of man harsh, while sound of woman sharp?

17) Sound travelling in air has less intensity than travelling in carbon dioxide?

18) Light can travel through free space?

19) The absolute refractive index for any transparent media is larger than 1?

20) The use of ultrasonic waves in milk sterilization?

21) The motion of rotary bee is considered as a periodic motion, but is not considered as an oscillatory motion?

22) The motion of a spring is an oscillatory motion?

23) We can't hear the sound of solar explosions, while we can see the light coming out of it?

1) Calyx and corolla (concerning of leaves and function).

2) Sperm and ovum (concerning of size, the mobility (movement), the structure and number).

3) Unisexual flowers and bisexual flowers.

4) The sound of lion and sound of sparrow (according to sound pitch and frequency).

5) Infrasonic and ultrasonic waves (frequency – examples).

6) Mechanical and electromagnetic waves (definition, properties and examples).

7) Oscillatory motion and wave motion (concerning definition and examples of each of them).

8) Transverse wave and longitudinal wave (definition, components of each, wavelength and examples).

10) What happens for each of the following after fertilization?

1) Ovary

2) Ovule

3) Zygote

11) Different types of questions·

1) If a spiral spring makes a longitudinal wave, calculate

    i. The wavelength of this wave, if you know that the distance between the second and thefourth compressions is 20 cm.

    ii. The wave velocity, if you know that the frequency of such wave is 150 Hertz.

2) Calculate the wavelength for each of the following :

    i   A longitudinal wave, the distance between its first and fourth rarefactions = 30 meter.

    ii, A transverse wave, the distance between its successive crest and trough = 8 meter

3) From the opposite figure find:

    i. The largest amplitude

    ii. The sharper tone

    iii. The rough tone

    iv. The higher intensity

(a)   (b)   (c)
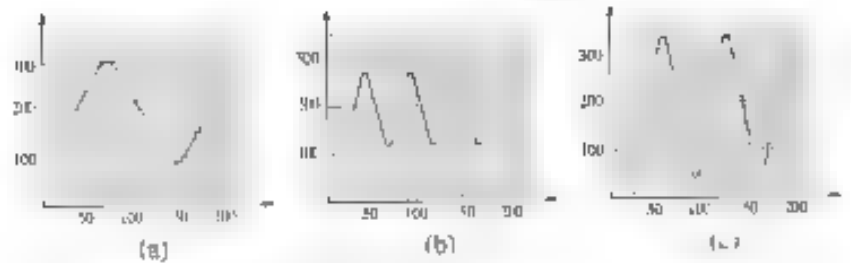
4) Look at the opposite diagram then answer the following:

    i. What is the name of this system?

    ii. Replace the numbers on the figure by the suitable labels.

    iii What is the organ which....?

        1. Ova are produced

        2, The ovum is fertilized

        3, Fetus is growing

        4. The embryo delivered to life

        5 Secrete progesterone
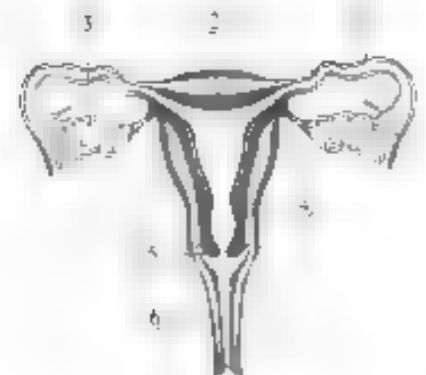
5) Look at the opposite figure , then answer the following questions :

    i. What does the figure represent?

    ii. Label the figure
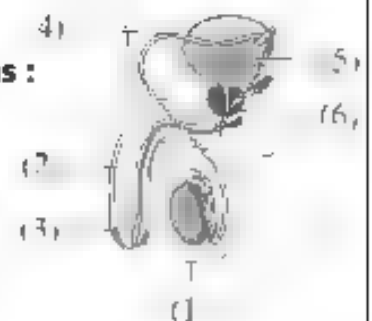
6) Look at the opposite figure , then answer the following questions :

     i.   what is the sex of the flower

     ii.   Label the figure

     iii.   The organ which consists of parts (7), (8)

         and (9)is called.............................

     iv.   The organ which consists of parts 5

         and 6 iscalled.........................
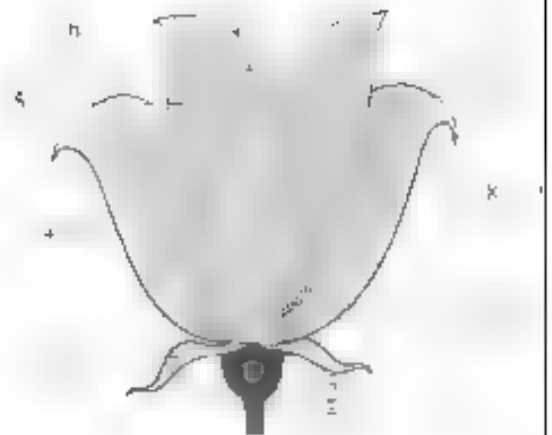
7) Mention the sex in each flower from the following:

8) Calculate the frequency of a tone produced from savart's wheel when touching a gearof 30 teeth that rotates in 960 cycles in two minutes.

9) Savart's wheel rotates with a rate of 300 cycles per minute. A sound frequency 600 Hz isproduced when an electric plate touches teeth of gear. Calculate the number of the gear teeth.

10) From the opposite, calculate :

   e. wavelength

   f. Frequency

   g. Amplitude

   h. Wave velocity
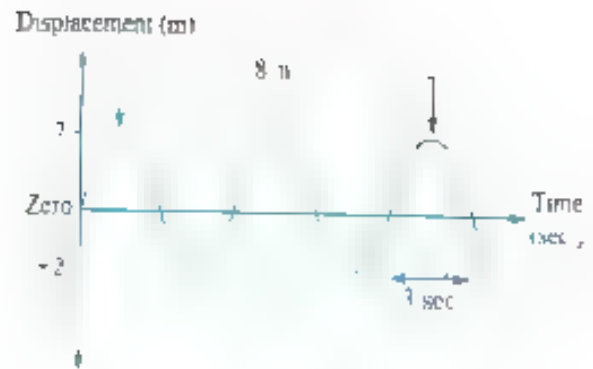
11) Calculate the absolute refractive index of diamond given that the speed of light throughit is 1.5×10^8 m/sec. knowing that the light velocity in air is 3×10^8 m/sec.

12) If the frequency of a sound wave is 200 Hz and the wavelength of this wave is 150 cm,calculate :

   The velocity of sound waves propagation in air.

Model Answers

1 Complete the following statements:

1. Calyx-sepal
2. Androecium-gynoecium
3. Testosterone-estrogen
4. The female cell(Ovum)-zygote
5. Half-all
6. Cowper's – prostate
7. Estrogen – progesterone
8. A fruit – a seed
9. Filament – anther
10. Green – sepal
11. Zygote – 23
12. 28
13. Sepals – petals
14. Cutting – grafting and tissue culture
15. Sperm – testosterone
16. Androecium – gynoecium
17. Nucleus of sperm – nucleus of ovum
18. Head – tail
19. Fruits
20. Sperm – testis
21. A root – stem -tuber
22. High – low
23. Watt/m² – Decibel
24. Light speed
25. 20 – 20000
26. Regular reflection – irregular reflection
27. Strong – weak
28. Sharp – rough
29. Density of the medium – amplitude
30. 40°
31. 660 Hz
32. Refraction – normal
33. Mechanical
34. Real – apparent
35. inversely – directly
36. Refractive index
37. Mirage – seeing objects higher than normal position
38. Broken
39. 65°
40. Doubled
41. The frequency of unknown tone
42. Frequency
43. Hertz – meter
44. 1
45. Crests – troughs
46. Compressions – rarefactions
47. Four
48. 600 sec.
49. Mechanical waves – electromagnetic waves
50. Sound
51. Time intervals
52. Simple harmonic motion
53. Mechanical
54. 0.24 sec.

2) Write scientific term for the following:

1. Flower
2. Calyx
3. Hermaphrodite
4. Stamens
5. Artificial pollination
6. testosterone
7. Corolla
8. Scrotal sac
9. Zygote
10. Mixed pollination
11. Fertilization
12. Gynoecium
13. Male flower
14. Genital associated glands
15. Cutting
16. Tissue culture
17. Tissue culture
18. The fallopian tube
19. Chromosomes
20. Zygote
21. Light refraction
22. Infrasonic waves
23. Speed of light
24. Sound pitch
25. Sound intensity
26. Optical density
27. Mirage
28. Sound
29. Harmonic tones
30. Irregular reflection
31. Light reflection 1st law
32. Refraction angle
33. Sound inverse square law
34. Refraction angle
35. Periodic time
36. Amplitude
37. Frequency
38. Periodic time
39. The line of wave propagation
40. Periodic motion
41. Oscillatory motion
42. Rarefaction
43. crest

3) Choose the correct answer:

1. c	11 a	21. a
2. d	12 b	22. c
3. a	13 b	23. b
4. b	14 b	24. d
5. c	15 a	25. c
6. b	16 c	26. c
7. d	17 b	27 b
8. a	18 a	28. b
9. b	19 c	
10. a	20 b	

4) Correct the underlined word:

1. carpel	8. progesterone	15 Vas deferens
2. androecium	9. air	16. Equals to
3. two testis	10 inflorescence	17 Is more than
4. half	11. carpel	18. 20
5. man	12 sperm	19. Ultrasonic
6. testis	13 fallopian tube	20. Incidence
7 asexual	14 cutting	21. Longitudinal

5) What happens when?

1 It will germinate forming a pollen tube.

2 The sperm will die during passing through urethra

3 The sperm will not have energy, so it will cannot move or attack the ovum

4 No pregnancy will occur

5 The pollen grain will not stick on stigma, and then pollen grain will not germinate

6 The light rays are reflected in different directions (irregular reflection)

7 Sound velocity will decrease, since velocity of sound through solids is higher than the velocity of sound through liquids

8. The frequency will decrease to half since ($v = F \times \lambda$)

9. The light ray will reflect on itself

10 The light ray will pass without any refraction

11. The sound intensity will decrease to its quarter

12 The velocity will increase to its maximum.

13. The kinetic energy = zero because the velocity at the maximum displacement = zero (K.E = ½ m v²)

14. The light ray will refract away from the normal

6) What is meant by?

1. It is the transfer of pollen grains from flower anthers to stigma

2. It is the transfer of pollen grains from the anthers of a flower to the stigmas of the same flower

3. It is the transfer of pollen grains from the anthers of a flower to the stigmas of another flower in other plant of the same kind

4. It is the type of pollination carried out by man like cutting, grafting, layering and tissue culture

5. It is the fusion of the nucleus of male cell (pollen grain) with the nucleus of female cell (ovum) to form the zygote.

6. It is the cell resulting from the fusion of the nucleus of male cell (pollen grain) with the nucleus of female cell (ovum).

7. It is the flower which contains male reproductive organ (androecium) and female reproductive organ (gynoecium)

8. It is the process of multiplying a small part of a plant to get many identical parts

9. It is the property by which the human ear can distinguish between sharp and rough sounds

10. It is the property by which the human ear can distinguish between strong and weak sounds

11. They are sound waves of frequencies ranges from 20 Hz – 20 KHz and can be heard by human ear

12. It means that the ratio between the speed of light in air to the speed of light through water equals 1.33

13. It is a natural phenomenon takes place on desert roads especially in the summer times where objects on the road side seems as if they have inverted images on a wet area

14. It is the angle between the emergent light ray and the normal at the point of emergence on the interface.

15. It is the rebounding of the light rays in the same medium on meeting a reflecting surface

16. It is the change of light path when it travels from a transparent medium to another transparent medium of different optical density

17. It is the ability of the transparent medium to refract light

18. It is the motion of the oscillating body around its rest point, where the motion is repeated through equal time intervals.

19 t is the disturbance that propagates and transfer energy in the direction of propagation

20 t means that the frequency of the oscilating body 1 6 Hz

21 t means that the distance between the centers of two successive compressions or refractions 30 cm

7 Mention one use or function for the following:

1 Protects the inner parts of flower especially before blooming

2 Stores the sperm.

3 Produces ovules

4 Protects the reproductive organ of flower

5 Produces and holds pollen grains.

6 Production of female sex hormone ,estrogen and progesterone)

7 Receive the ripe ovum and direct it to the uterus.

8 Production of male sex hormone (testosterone)

9. t regulates and keeps the temperature of the two testis two degrees below the normal body temperature which is suitable for growth and development of sperms.

10 Contain one half of the genetic material.

11 t contains mitochondria which responsible for the Production of the energy needed for the sperm movement

12 Responsible for the appearance of secondary sex characters in male

13 Responsible for the appearance of secondary sex characters n female.

14 Responsible for the occurrence and continuity of pregnancy

15 Secrete a seminal fluid which nourishes the sperm, facilitate the flow of sperms and neutralize the acidity of urethra.

16 Sterilization of water, food and milk breaking down of kidney and ureter stones

17 Used to treat sprains and cramps by using hot water – nervous tension by using cold water

18 Used in radars

8 Give reason for the following:

1. To attract insects which help in reproduction process.

2. To direct the ripe ovum towards the uterus.

3. Because the scrotal sac regulates and keeps the temperature of the two testis two degrees below the normal body temperature which is suitable for growth and development of sperms.

4. Because some of them contain only male reproductive organ (androecium only) and the others contain only female reproductive organ (gynoecium only)

5. To stick on the insect body

6. Because the sound of thunder is mechanical wave and the light of thunder is electromagnetic wave, where the speed of electromagnetic waves is much higher than speed of mechanical wave

7. Because in barley plant the anthers and stigmas are matured at the same time, while in sunflowers the anthers and stigmas are not matured at the same time

8. To make easy movement till reaches the ovum.

9. Because the placenta is responsible for the nourishment of fetus (through umbilical cord) during pregnancy

10. Because it has thick muscular wall that is rich in blood capillaries which feed the embryo and supply it with oxygen and also protect the embryo until birth.

11. Because the ovary of the peach contains only one ovule so it contains only one seed

12. to neutralize the acidity of urethra, so the sperms don't die during passing through urethra

13. Because the incidence angle = reflection angle = zero

14. Due to refraction of light where the eye see the extension of the refracted rays

15. Due to refraction of light where the eye see the extension of the refracted rays

16. Because the sound of man has low frequency (low pitched) and the sound of woman has high frequency (highly pitched).

17. Because the density of carbon dioxide is higher than that of air and the sound velocity increases by increasing density of the medium.

18. Because light is electromagnetic waves which does not need a medium to propagate through

19. Because the speed of light through air is larger than the speed of light in any other transparent medium

20. Because ultrasonic waves have the ability to kill some types of bacteria and stop the action of some viruses

21. Because its motion is not repeated on the two sides of its rest position

22. Because its motion is around its rest point through equal time intervals

23. Because the sound of solar explosions is a mechanical wave which need a medium to propagate through while light is electromagnetic wave which can propagate through vacuum

9) Compare between:

Points of comparison	calyx	corolla
Leaves	Green leaves Each leaf is called a sepals	Colored and scented leaves Each leaf is called petal
function	It protects the inner part of the flower especially before blooming.	It protects the male and female reproductive organs of flowers Attract insects which help in reproduction process.

Points of comparison	sperm	ovum
Size	small	Relatively large
Mobility	mobile	Static (not mobile)
The structure	Consists of head, midpiece and tail	Consists of nucleus, cytoplasm and cellular membrane
The number	The testis produce large number	Each ovary produces one ripe ovum every 28 days in exchange with the other ovary

Un sexual flowers	B sexual flowers
Contain only male reproductive organ or female reproductive organ	Contain both male and female reproductive organs
Contain (3) whorls	Contain (4) whorls
Examples :palms, maize and pumpkin	Examples :tulip, petunia and wallflower

Points of comparison	Regular reflection	Irregular reflection
definition	It is the reflection of light rays when they fall on a smooth glistening surface, where the incident light rays are reflected in one direction.	It is the reflection of light rays when they fall on a rough surface, where the incident light rays are reflected in different direction.
examples	A plane mirror, A stainless steel sheet	A leaf of tree A piece of paper

Points of comparison	The sound of lion	The sound of sparrow
Sound pitch	Low pitched	High pitched
frequency	Low frequency	High frequency
amplitude	Lower amplitude	Higher amplitude

Points of comparison	Infrasonic waves	ultrasonic waves
frequency	They are sound waves of frequencies less than 20 Hz	They are sound waves of frequencies higher than 20 KHz
examples	The waves accompany the storms that precede rain	Some animals such as bats, dogs and dolphins can hear ultrasonic waves

Points of comparison	Mechanical waves	Electromagnetic waves
definition	They are waves which need a medium to propagate through.	They are waves which don't need a medium to propagate through
properties	They don't propagate through vacuum	They can propagate through vacuum
velocity	Their velocity is relatively low	Their velocity is great (3×10^8)
examples	They are • Transverse waves : (as water waves) • Longitudinal waves: (as sound waves)	They are all transverse waves as -light waves -radio waves -x-ray

Points of comparison	Oscillatory motion	Wave motion
definition	It is the motion of the oscillating body around its rest point, where the motion is repeated through equal time intervals.	It is the motion produced as a result of the vibration of the medium particles at certain moment and in a definite direction.
examples	Pendulum motion Motion of spring	Sound waves Light waves

Points of comparison	Transverse wave	Longitudinal wave
Definition	Is the disturbance at which particles of the medium vibrate perpendicular to direction of wave propagation	Is the disturbance at which particles of the medium vibrate along to direction of wave propagation
Components	Crests and troughs	Compressions and rarefactions
Wavelength	The distance between two successive crests or troughs	The distance between the centers of two successive compressions or rarefactions.
examples	Water waves	Sound waves

1) What happens for each of the following after fertilization?

1. Becomes a fruit.
2. Becomes a seed
3. Successive divisions to form the embryo

1 Different types of questions*

1. a. number of waves = 2

   Wavelength = $\dfrac{\text{distance covered by the waves}}{\text{number of waves}} = \dfrac{20}{2} = 10$ cm

   b. wave velocity = frequency x wavelength

   Wave velocity = 150 x 0.1 = 15 m/sec.

----

2. a. number of waves = 3

   Wavelength = $\dfrac{\text{distance covered by the waves}}{\text{number of waves}} = \dfrac{30}{3} = 10$ meter

   b. wave length = the horizontal distance between successive crest and trough

   = 2 x 8 = 16 meter

----

3   a (c)
    b (b)
    c (a)
    d (c)

----

4. a. Reproductive organ of female   c.
    b. (1) → fallopian tube   i.   Ovary
        (2) → Uterus   ii. Top of fallopian tube
        (3) → Ovary   iii. Uterus
        (4) → Uterus muscle   iv   Vagina
        (5) → Cervix   v,   Ovary
        (6) → Vagina

----

5. a. Reproductive organ of male
    b. (1) → Testis
        (2) → Penis
        (3) → Urethra
        (4) → Vas deferens
        (5) → Urinary bladder
        (6) → Prostate gland

----

6. a. Typical flower (hermaphrodite)   (6) → Anther
    b. (1) → Pedicle   (7) → Stigma
        (2) → Receptacle   (8) → Style
        (3) → Sepal   (9) → Ovary
        (4) → Petal   c. Carpel
        (5) → Filament   d. Stamen

----

7   (1) bisexual (hermaphrodite) flower

    (2) Female flower (unisexual)

    (3) Male flower (unisexual)

----

8. $Frequency = \dfrac{d\,(number\ of\ cycles) \times n\,(number\ of\ teeth}{t\,(time)}$

    $Frequency = \dfrac{960 \times 30}{120} = 240\ Hz$

9. $Frequency = \dfrac{d\ (number\ of\ cycles) \times n\ (number\ of\ teeth}{t\ (time)}$

$600 = \dfrac{300 \times n}{60}$ → 600 x 60 = 300 x n

Number of teeth (n) = 120 teeth

----

10 Wavelength = 4 m

Periodic time = 6 sec. → Frequency = $\dfrac{1}{6}$ Hz

Amplitude = 2m

Wave velocity = F x λ – $\dfrac{1}{6}$ x 4 = 0 6 m/sec.

----

11 Absolute refractive index of diamond – $\dfrac{Speed\ of\ light\ throgh\ air}{Speed\ of\ light\ through\ diamond}$

Absolute refractive index of d amond = $\dfrac{3 \times 10\ 8}{1.5 \times 10\ 8}$ = 2

----

12 Wave velocity (v) – frequency (f) x wave ength (λ)

v = 200 x 0 15 = 30 m/sec.

A-Give reason for the following:

1-Oscillatory motion is considered as periodic motion?
Bec. It is repeated in equal periods of time.

2-The waves due to vibration of strings are mechanical transverse waves?
Mechanical because it needs a medium to travel And transverse because the particles of medium vibrate perpendicuar to the wave direction

3-We see lightening before hearing thunder?
Bec. Light is an electromagnetic wave that has high speed while sound is a mechanical wave that has low speed.

4-The product of frequency multiplying the periodic time equals 1 ?
Bec, the relation between them is inversey proportional.

5-Sound waves are mechanical waves while radio waves are electromagnetic?
Bec, sound waves need medium to travel while radio waves can travel in space.

6-Sound can be heard from all surrounding directions?
Bec, sound travels as spherica waves that consist of compressions and rarefactions

7-The intensity of sound decreases as the distance between the era and sound source is increased?
Bec, sound intensity is inversely proportional to the square of distance

8-The strings of a musical lute are fixed on a hollow wooden box?
To increase the vibrating surface to increase the sound intensity.

9-Sound intensity in air is less than sound intensity in CO_2 ?
Bec the density of carbon dioxide is more than the density of air

10-Piano's sound differs from violin even if they have the same intensity and pitch?
Bec, they have different quality of sound as they produce different harmonic tones

11-The use of ultrasonic waves in milk sterilizing?
Bec, ultrasonic waves kill microbes.

12-Sound of man is harsh while sound of woman is sharp?
Bec. Sound of man is low pitched (low frequency) while sound of woman is high pitched (high frequency).

13- When sound ray is incidence perpendicular to a reflecting surface, it reflects on itself ?
- Bec, angle of incidence = angle of reflection = zero.

14-When light ray travels from water to air it refracts far from the normal?
-Bec,the optical density of water is more than air.

15-Palm flowers are unisexual?

Bec, the flowers contain only male or female reproductive organ

16-Flowers pollinated by air having hanging anthers and feathery stigmas?

Bec. Anthers open by wind and feathery stigma collects pollen grain from air.

17-Pollen grains are produced in large numbers?

To guarantee the fertilization process.

18- The fallopian tubes in human female are lined with cilia?

To push the ovum to the uterus.

19- The formation of inverted images of the trees on the road when rain falls.

Due to reflection of light.

20- The leather jacket produces irregular light reflection, while a stainless steel plate produces regular light reflection.

Because leather jacket is rough surface, while stainless steel plate is smooth surface.

21- The light ray that is incident perpendicular on a glistening surface reflects on itself.

Because angle of incidence = angle of reflection = zero

22- The light refracts when it travels from one medium to another.

Due to the difference of the light velocity through the different transparent media.

23- When light ray travels from air to water it refracts near to the normal.

Because water has higher optical density than air

24- The absolute refractive index of a medium is always greater than one.

Because the velocity of light through air is always greater than that through any other transparent medium.

29- To see a coin which has fallen in a beaker filled with water in its real position we must look at it vertically.

Because the ray which falls perpendicular to the interface passes to air without refraction.

B- Study the opposite figure then answer

1-the function of number 1 is...............

(It produces pollen grains.)

2-the function of number 2 is.............

(Attract insects and protect reproductive organs)

3-the function of number 5 is..................

(It produces ovules)

4-the sex of this flower is ....

(male - female - bisexual)
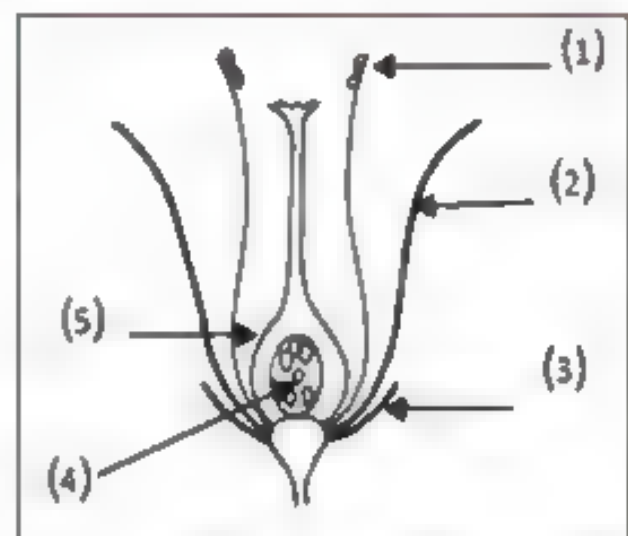
C-Study the opposite figure,
then answer the following questions:
1-**Fallopian tube.**
2-**Uterus.**
3-**Ovary.**
4-This figure represents...............

(Female reproductive system)
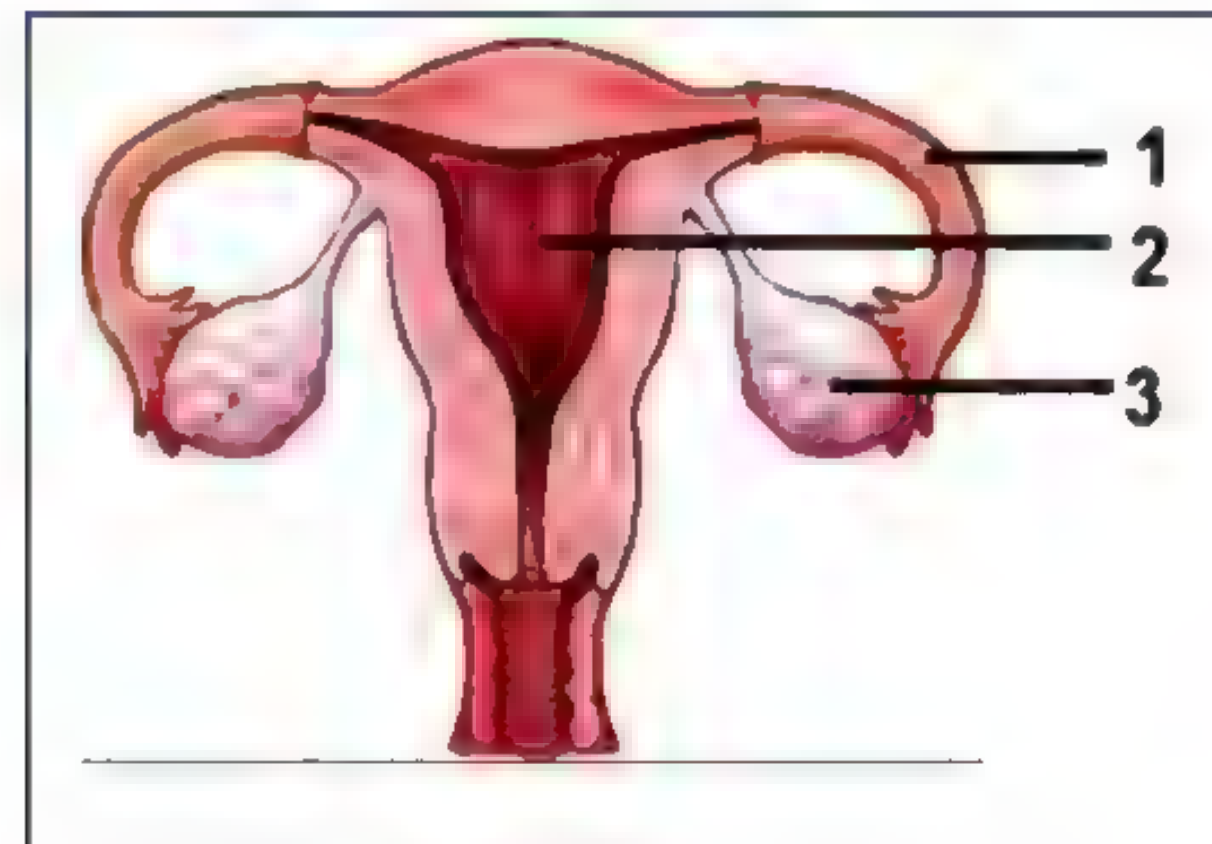
D-From the opposite figure
Find:

1-Wavelength = ...
2-Amplitude = ...
3-Periodic time= ....
4-Frequency= ....
5-Wave velocity= ....
6-The relation between frequency
and its velocity is............ proportional
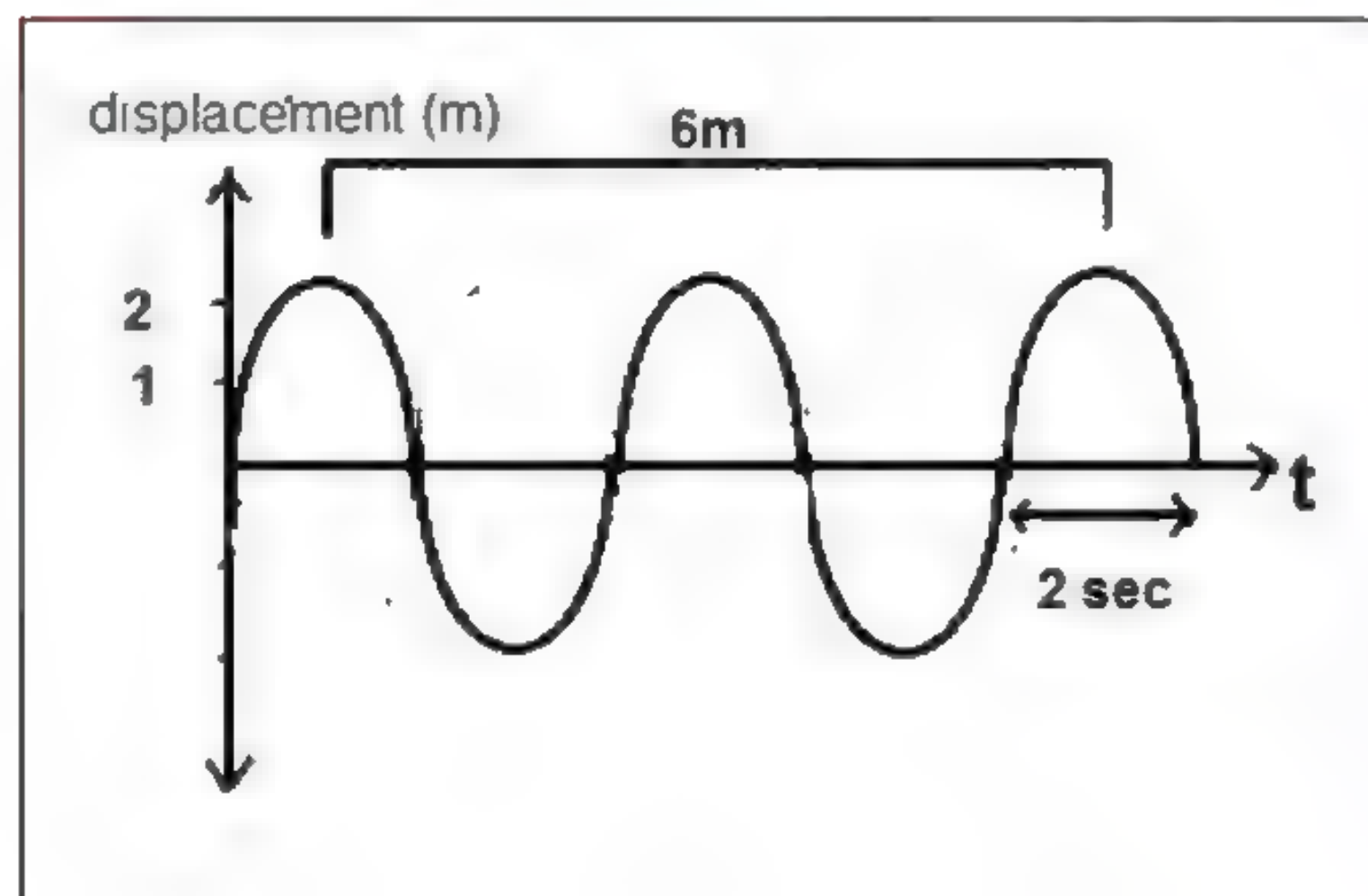
E- Compare between:

	Transverse waves	Longitudinal waves
Direction of particles vibration		
Structure		
Wavelength		
Ex:		

Mechanical waves	Electromagnetic waves
Waves that need ………. and can't propagate in ……………	Waves that don't need ………… and propagate in …………
They are ………or …………. waves	They are ………… … waves only.
Their speed is relatively ………	Their speed is …………
Ex: ……… waves, ………… waves.	Ex: ……… waves , ……… waves .

	Sperm	Ovum
Size		
Number		
Motion		

	Regular reflection	Irregular reflection
surface		
direction		
Examples		

	Red light	Violet light
Frequency	Lowest	Higher
Energy of photon	Lowest	Higher
Wavelength	Longest	Shortest

F- Mention the function:

Floral whorls	Function
1-Calyx	-It protects the inner parts of the flower specially before blooming.
2-Corolla	-It protects the reproductive organs.-It attracts insects to the flower which helpsin the reproduction process.
3-Anderoecium	-It protects and hold pollen grains (inside the pollen chamber).
4-Gynoecium	-It produces ovules

G- Problems:

1- calculate the frequency and periodic time of an oscillating body which makes 240 oscillations in 2 minutes.

2- If the max. Displacement done by the oscillating body away from its original position is 0.2 cm which is made in 0.5 second.

Ccalculate its amplitude and the periodic time.

3- Sound waves of frequency 200 Hz and wavelength 1.7 m.

Calculate:The velocity of sound waves in air?

....

----

4. Savart's wheel produces a sound of frequency 200 Hz. When a metallic plate touches a gear having 50 teeth. Find the time taken by the wheel to make 360 rotations.

....

5. Calculate the frequency of a musical tone similar to the frequency of a produced tone using Savart's wheel rotated with a velocity of 960 cycles in two minutes, given that the number of teeth of the gear is 30 teeth

....

....

6-Calculate the velocity of light through glass if you know that the velocity of light through air is 3×10^8 m/sec. and the absolute refractive index of glass is1.5.

....

....

7-Calculate the absolute refractive index of diamond given that the speed of light through it is 1.25×10^8 m/sec. knowing that the velocity of light through air is 3×10^8 m/sec.

....

....

Good luck & have fun ☺
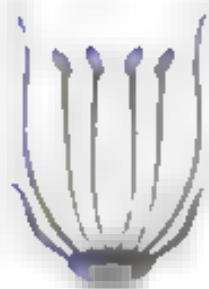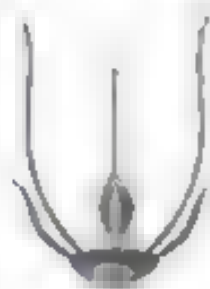
♂ Male flower   ♀ Female Flower   ☿ Bisexual flower

Model exam (1)

Question 1

(A):Choose the correct answer:

1- The distance between 2 successive crests or troughs is ……………..

(a-frequency.   b-amplitude.   c-periodic time   d- wavelength)

2-All of the following are factors affecting sound intensity except …………….

(a-amplitude   b-medium density   c-frequency   d-wind direction)

3-The typical flower consists of ………….. whorls.

(a-three   b-four   c-five   d-six)

4-If the frequency of an oscillating body is 2 Hz, so its periodic time = …………..

a- (0.5 sec   b-0.2 sec   c-2 sec   d-1 sec)

5-If the angle between the incident ray and the reflecting surface = 40 , so the angle of reflection =………….

(a-30°   b-40°   c-50°   d-60°)

6-The right ovary in the human female produces a mature ovum every ……….days.

(a-24 b-28   c-38   d-56)

(B):Give reason for each of the following:

1-The voice of women is sharp while the voice of men is harsh?

………

2-The product of multiplying the frequency and the periodic time of an oscillating body = 1?

………

3-The fallopian tubes are lined with cilia?

………

(C): Mention the importance or the function of the following:

1-Ultrasonic waves (in medical field).

………

2- Calyx.

………

Question 2

(A): Put (√) or (X) in front of the following and correct the wrong statements:

1-The motion of the tuning fork is an oscillatory motion.　(　)

2-Large and coloured flowers that contain nectar, are pollinated by man.　(　)

3-Sound waves are mechanical and transverse waves.　(　)

4-Jaccuzi is used treat nervous tension with cold water.　(　)

(B): Problem: Calculate the absolute refractive index of diamond given that the speed of light through it is 1.5×10^8 m/sec, Knowing that the speed of light in air is 3×10^8 m/sec?

....

(C): Compare between each of the following:

1-Transvere wave and longitudinal waves. (according to the direction of medium particles)

2-Infra sonic waves and ultrasonic waves. (according to the frequency)

3-Sperm and ovum (according to the size)

Question 3

(A):Write the scientific term for each in the following:

1-Maxiumu displacement made by oscillating body away from point of rest.

2-An external factor affecting the ear causing the sense of hearing.

3-The transfer of pollen grains from anther to the stigma of the flower.

4-Waves that need medium to travel and can't propagate in space.

5-the change of in path of light ray when it passes from a transparent medium to another.

6-The female reproductive organ in the flower.

(B):What will Happen in the following :

1-The oscillating body moves away from its rest point (for the velocity)

....

2-Light ray passes from air to water.

....

3-Ovary of the flower after fertilization.

....

(C):**Problem**: A wave of frequency = 512 Hz. And its wavelength =0.5 m, calculate the velocity of this wave?

....

Question 4:

(A): Complete the following:

1-The complete oscillation contains ……………displacements each of them is called ……………

2-The measuring unit of sound intensity is ……………….while the unit of noise intensity is ………………

3-The function of testis in man is to produce ……………….and ……………….hormone.

4-……………………….and ………………….are the two types of light reflection.

(B): What is meant by:

1-sound intensity.

....

2-Fertilization in Human.

....

Model exam (2)

Question (1):-

A) Write the scientific term:-

1. The measuring unit of sound intensity.   (   )
2. The distance covered by the wave in one second.(   )
3. A short stem where the leaves are modified into reproductive organs. (   )
4. The area in the longitudinal wave, at which the medium particles are of the lowest density & pressure.   (   )
5. The tones accompanying the fundamental tone but they are higher in pitch & lower in intensity.   (   )
6. A group of colored leaves in flowers, each is called petal.(   )
7. The reflection of light rays in many directions when falling on a rough surface. (   )
8. An oval-shaped gland that produces human male cells.   (   )

B) Give an example for:-

a) An oscillatory motion

....

b)A male hormone

....

C) Give reasons for:-

1. Ultrasonic waves have industrial uses.

....

2. Increasing the periodic time of the oscillating body decreases its frequency.

....

Question (2):-

A) Choose the correct answer:-

1. Ovary, style and stigma are the structure of the.............
a)corolla   b)stamen   c)carpel

2. If the angle between the incident light ray & the reflected light ray is 90°, so the angle of incidence equals ....
a)0°   b)30°   c)45°

3. The periodic time of an oscillating body which makes 240 oscillations in one minute equals ....
a)1 sec.   b)1/4 sec.   c)4 sec.

4. The human ear can hear sounds of frequency ....
a) 50 KHz   b)30 KHz   c)300 Hz

5. Fertilization is the process of fusion of the male & female cells to form ....
a)zygote   b)sperm   c)ovum

6. All of the following are factors affecting sound intensity except the ....
a)amplitude of vibration   b)medium density   c)frequency

7. When a light ray travels from air to glass, it refracts .... the normal.
a)near   b)far from   c) tangent to

8. The complete oscillation includes .... displacements.
a)one   b) two successive   c) four successive

B) Give one difference between each of the following:-
a) Infrasonic & ultrasonic waves (concerning their frequencies)

b) Mechanical & Electromagnet waves (concerning their speeds)

c)Sperm & ovum (concerning their sizes)

C) A Problem:-
Savart's wheel rotates with a rate of 120 cycles per minute. A sound of frequency 300 Hz is produced when an elastic plate touches the teeth of one gear. Calculate the number of gear's teeth.

....

Question (3):-

A) Complete the following statements:-

1. Longitudinal wave consists of .... & ....

2. After fertilization, the ovary grows forming the ...., while the ovule converts into the ....

3. Sharp tones have .... frequencies, while rough tones have .... frequencies.

4. The sperm consists of ...., middle part & ....

B) Mention one use/importance for each of the following:-

a) Calyx:

....

b) Epididymis:

....

c) Jacuzzi:

....

C) Correct the underlined words:-

a)**Gynoecium** is the male organ of flower.

b)Particlesof the medium vibrate along the direction of the wave propagation in the **transverse** wave.

c) The absolute refractive index of any material is always **smaller than** one.

Question (4):-

A) Put (√) or (x) & correct the wrong ones:-

1. The velocity of the oscillating body has maximum value when it passes its rest position.

2. Palm trees are pollinated by air.

3. The sound intensity decreases, when the source of sound touches an empty box.

4. Water waves are electromagnetic waves.

B) What happens when:-

1.   The sound direction opposes the air flow direction.

....

2.   A light ray falls perpendicular on a reflecting surface.

....

3.   The frequency of a wave is increased (concerning the wavelength) when its velocity is constant.

....

(C): Study the opposite figure, then answer:

1-the function of number 1 is ………………………………..

2-the function of number 2 is ……………………………..

3-the function of number 5 is ……………………………..
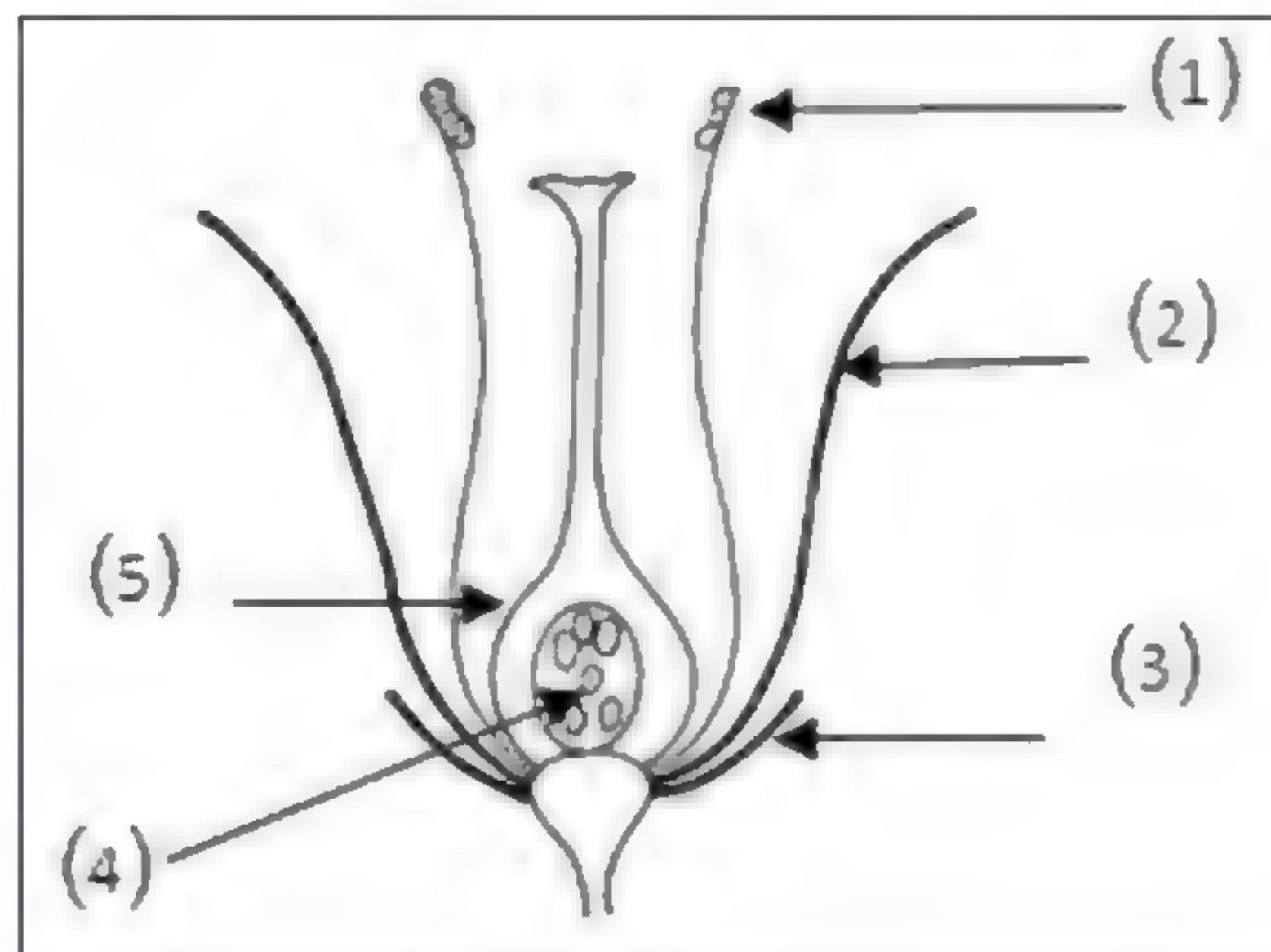
Good luck & Have fun ☺

waves.

Their speed is relatively **slow**	Their speed is **faster** (speed of light $= 3 \times 10^8$ m/sec)
Ex: **water** waves, **sound** waves.	Ex: **light** waves , **Radio** waves .

	Sperm	Ovum
Size	**Relatively smaller than ovum**	**Relatively large**
Number	**Very large (billions/ejaculate)**	**1**
Motion	**mobile**	**Static**

	Regular reflection	Irregular reflection
Surface	**smooth**	**rough**
Direction	**One direction**	**scattered**
Examples	**mirror**	**Leather - wood**

	Red light	Violet light
Frequency	Lowest	Higher
Energy of photon	Lowest	Higher
Wavelength	Longest	Shortest

	A transparent Medium	A translucent Medium	An opaque Medium
	permits the light to pass through it.	permits part of the light to pass through it and absorbs some light.	does not permit light to pass through it.
Examples	Clear air Clear water	Tissue paper Frosted glass	Black honey book

F- Mention the function:

Floral whorls	Function
1-Calyx	It protects the inner parts if the flower specially before blooming.
2-Corolla	1- Attracts insects. 2- Protects the reproductive organs.
3-Anderoecium	Production of male gametes (pollen grains)
4-Gynoecium	Production of female gametes (ovules)

G- Problems:

1- calculate the frequency and periodic time of an oscillating body which makes 240 oscillations in 2 minutes.

Frequency = no. of complete oscillations / time(sec) = 240 / (2x60) = 2 Hertz

Periodic time = 1/F = 1/2 = 0.5 sec

2- If the max. Displacement done by the oscillating body away from its original position is 0.2 cm which is made in 0.5 second.

Calculate its amplitude and the periodic time.

Amplitude = max displacement = 0.2 cm

Periodic time = 4 x 0.5 = 2 sec

3- Sound waves of frequency 200 Hz and wavelength 1.7 m.

Calculate: The velocity of sound waves in air?

Velosity = F x λ = 200 x 1.7 = 340 m/sec

4. Savart's wheel produces a sound of frequency 200 Hz. When a metallic plate touches a gear having 50 teeth. Find the time taken by the wheel to make 360 rotations.

Time = no. of cycles x no. of gear teeth / frequency

= (360 x 50) / 200 = 90 sec

----

5. Calculate the frequency of a musical tone similar to the frequency of a produced tone using Savart's wheel rotated with a velocity of 960 cycles in two minutes, given that the number of teeth of the gear is 30 teeth.

F = no. of cycles x no. of gear teeth / time

= (960 x 30) / 2 x 60 = 240 Hz

6-Calculate the velocity of light through glass if you know that the velocity of light through air is 3×10^8 m/sec. and the absolute refractive index of glass is1.5.

Velocity of light through glass = velocity of light through air / refractive index of glass

= 3×10^8 / 1.5 = 2×10^8 m/sec

7-Calculate the absolute refractive index of diamond given that the speed of light through it is 1.25×10^8 m/sec. knowing that the velocity of light through air is 3×10^8 m/sec.

Absolute refractive index of diamond = $\dfrac{velocity\ of\ light\ through\ air}{velocity\ of\ light\ through\ diamond}$

$$= \frac{3\ x\ 10^8}{1.25\ x\ 10^8} = 2.4$$

Good luck & have fun ☺
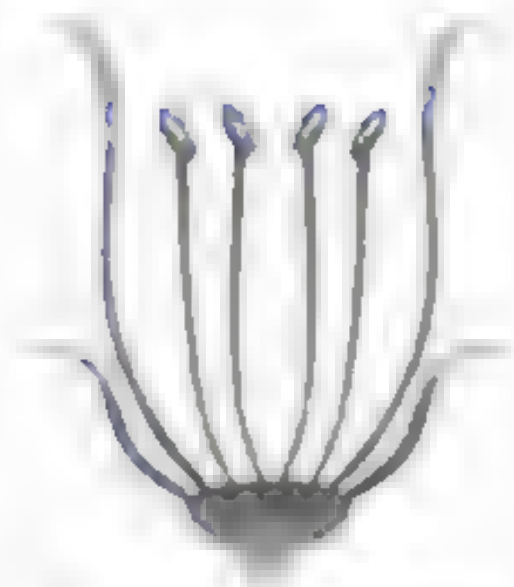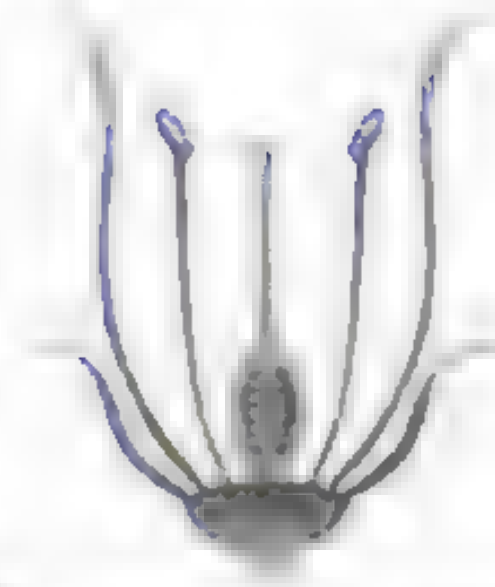
♂ Male flower   ♀ Female Flower   ☿ Bisexual flower

Model Exams

Model exam (1)

Question 1

(A):Choose the correct answer:

1- The distance between 2 successive crests or troughs is ……………..

(a-frequency.   b-amplitude.   c-periodic time   **d- wavelength**)

2-All of the following are factors affecting sound intensity except ……………

(a-amplitude   b-medium density   **c-frequency**   d-wind direction)

3-The typical flower consists of ………….. whorls.

(a-three   **b-four**   c-five   d-six)

4-If the frequency of an oscillating body is 2 Hz, so its periodic time = …………..

a- (0.5 sec   b-0.2 sec   c-2 sec   d-1 sec)

5-If the angle between the incident ray and the reflecting surface = 40 , so the angle of reflection =.............

(a-30°   b-40°   **c-50°**   d-60°)

6-The right ovary in the human female produces a mature ovum every ....days.

(a-24 b-28   c-38   **d-56)**

(B):Give reason for each of the following:

1-The voice of women is sharp while the voice of men is harsh?

Because the voice of the woman is high pitched while that of man is low pitched

2-The product of multiplying the frequency and the periodic time of an oscillating body = 1?

Because they are reciprocal to each other.

3-The fallopian tubes are lined with cilia?

To push ovum toward the uterus.

(C): Mention the importance or the function of the following:

1-Ultrasonic waves (in medical field).

1- **Breaking down kidney and ureters stones without any surgical operations.**

2- **Diagnosis of male prostate gland tumors and its effect on bladder.**

3- **Discovering carcinogenic tumors.**

2- Calyx.

It protects the inner parts if the flower specially before blooming

Question 2

(A): Put (√) or (X) in front of the following and correct the wrong statements:

1-The motion of the tuning fork is an oscillatory motion.   (**√**)

2-Large and coloured flowers that contain nectar, are pollinated by man. (**X**)

3-Sound waves are mechanical and transverse waves.   (**X**)

4-Jaccuzi is used treat nervous tension with cold water.   (**√**)

(B): Problem: Calculate the absolute refractive index of diamond given that the speed of light through it is 1.5×10^8 m/sec, Knowing that the speed of light in air is 3×10^8 m/sec?

Absolute refractive index of diamond $= \dfrac{velocity\ of\ light\ through\ air}{velocity\ of\ light\ through\ diamond}$

$$= \frac{3 \times 10^8}{1.5 \times 10^8} = 2$$

(C): Compare between each of the following:

1-Transvere wave and longitudinal waves. (according to the direction of medium particles)

	Transverse waves	Longitudinal waves
Direction of medium particles vibration	Perpendicular to line of propagation	Along the line of propagation

2-Infra sonic waves and ultrasonic waves. (according to the frequency)

	Infra sonic waves	ultrasonic waves
Frequency	Less than 20 Hz	More than 20 KHz

3-Sperm and ovum (according to the size)

	Sperm	Ovum
Size	Relatively smaller than ovum	Relatively large

Question 3

(A):Write the scientific term for each in the following:

1-Maxiumum displacement made by oscillating body away from point of rest.

<div align="right">

Amplitude

</div>

2-An external factor affecting the ear causing the sense of hearing.   **Sound**

3-The transfer of pollen grains from anther to the stigma of the flower. **Pollination**

4-Waves that need medium to travel and can't propagate in space. **Mechanical waves**

5-the change of in path of light ray when it passes from a transparent medium to another.   **Light refraction**

6-The female reproductive organ in the flower.   **Gynoecium**

(B):What will Happen in the following :

1-The oscillating body moves away from its rest point (for the velocity)

The velocity decreases and will equal zero at maximum displacement.

2-Light ray passes from air to water.

Refracts near to the normal line.

3-Ovary of the flower after fertilization.

Develops and become the fruit.

(C):Problem: A wave of frequency = 512 Hz. And its wavelength =0.5 m, calculate the velocity of this wave?

Velosity = F x λ = 512 x 0.5 = 256 m/sec

Question 4:

(A): Complete the following:

1-The complete oscillation contains **four** displacements each of them is called
   amplitude

2-The measuring unit of sound intensity is **watt / m²** while the unit of noise intensity is
Decibel

3-The function of testis in man is to produce **Sperm** and **testosterone** hormone.

4- **Regular** and **irregular** are the two types of light reflection.

(B): What is meant by:

1-sound intensity.

It is the property by which the ear can distinguish between sounds either strong or weak.

2-Fertilization in Human.

It is the fusion of the nucleus of male gamete (sperm) with the nucleus of female gamete (ovum) to form the zygote (fertilized ovum)

Model exam (2)

Question (1):-

A) Write the scientific term:-

1. The measuring unit of sound intensity. (watt/m^2)
2. The distance covered by the wave in one second. (velocity)
3. A short stem where the leaves are modified into reproductive organs. (flower)
4. The area in the longitudinal wave, at which the medium particles are of the lowest density & pressure. (Rarefaction)
5. The tones accompanying the fundamental tone but they are higher in pitch & lower in intensity. (Harmonic tones)
6. A group of colored leaves in flowers, each is called petal. (Corolla)
7. The reflection of light rays in many directions when falling on a rough surface. (Irregular reflection)
8. An oval-shaped gland that produces human male cells. (Testes)

B) Give an example for:-

a) An oscillatory motion

Simple pendulum.

b) A male hormone

Testosterone.

C) Give reasons for:-

1. Ultrasonic waves have industrial uses.

   Because it can be used in Sterilization of food, water and milk. As it characterized by its high ability to kill some types of bacteria and stop the action of some viruses

2. Increasing the periodic time of the oscillating body decreases its frequency.
   Because the relation between them is inverse relation.
3. The pen appears broken in a cup of water.
   Due to light refraction.

Question (2):-

A) Choose the correct answer:-

1. Ovary, style and stigma are the structure of the.............
   a)corolla   b)stamen   **c)carpel**

2. If the angle between the incident light ray & the reflected light ray is 90°, so the angle of incidence equals ....
   a)0°   b)30°   **c)45°**

3. The periodic time of an oscillating body which makes 240 oscillations in one minute equals ....
   a)1 sec.   **b)1/4 sec.**   c)4 sec.

4. The human ear can hear sounds of frequency ....
   a) 50 KHz   b)30 KHz   **c)300 Hz**

5. Fertilization is the process of fusion of the male & female cells to form ....
   a)zygote   b)sperm   c)ovum

6. All of the following are factors affecting sound intensity except the ....
   a)amplitude of vibration   b)medium density   **c)frequency**

7. When a light ray travels from air to glass, it refracts .... the normal.
   a) near   b)far from   c) tangent to

8. The complete oscillation includes .... displacements.
   a)one   b) two successive   **c) four successive**

B) Give one difference between each of the following:-

a) Infrasonic & ultrasonic waves (concerning their frequencies)
   Infrasonic waves : low frequency (less than 20Hz)
   ultrasonic waves : very high frequency (more than 20 KHz)

b) Mechanical & Electromagnetic waves (concerning their speeds)
   Mechanical waves   :   low speed
   Electromagnetic waves :   very high speed (speed of light through air 3×10^8 m/sec)

c)Sperm & ovum (concerning their sizes)
   Sperm : small related to ovum
   Ovum : larger than sperm

C) A Problem:-

Savart's wheel rotates with a rate of 120 cycles per minute. A sound of frequency 300 Hz is produced when an elastic plate touches the teeth of one gear. Calculate the number of gear's teeth.

No. of gear teeth = F x time(sec) / no. of cycles

= (300 x 60) / 120 = 150 teeth

Question (3):-

A) Complete the following statements:-

1. Longitudinal wave consists of **compressions** & **rarefactions**

2. After fertilization, the ovary grows forming the **fruit** while the ovule converts into the **seed.**

3. Sharp tones have **high** frequencies, while rough tones have **low** frequencies.

4. The sperm consists of **head,** middle part & **tail**

B) Mention one use/importance for each of the following:-

a) Calyx:

protect all internal parts of the flower specially before blooming.

b) Epididymis:

Store the sperms.

c) Jacuzzi:

Treatment of nervous tension (by cold water)

Treatment of sprain (by hot water)

C) Correct the underlined words:-

a)<u>Androecium</u> is the male organ of flower.

b)Particles of the medium vibrate along the direction of the wave propagation in the <u>Longitudinal </u>wave.

c) The absolute refractive index of any material is always <u>larger than</u> one.

Question (4):-

A) Put (√) or (x) & correct the wrong ones:-

1.   The velocity of the oscillating body has maximum value when it passes its rest position.   **(√)**

2.   Palm trees are pollinated by **air**.   **(x)**
          By man

3.   The sound intensity **decreases**, when the source of sound touches an empty box.
                              increases   **(x)**

4.   Water waves are **electromagnetic** waves.   **(x)**
                    mechanical

B) What happens when:-

1.   The sound direction opposes the air flow direction.
        The sound intensity decreases.

2.   A light ray falls perpendicular on a reflecting surface.
          It will reflect on itself

3.   The frequency of a wave is increased (concerning the wavelength) when its velocity is constant.
          The wave length decreases.

(C): Study the opposite figure, then answer:

1-the function of number 1 is **production of male gametes(pollen grains)**

2-the function of number 2 is **attracts insects & protects the reproductive organs.**

3-the function of number 5 is **production of female gametes(ovules)**
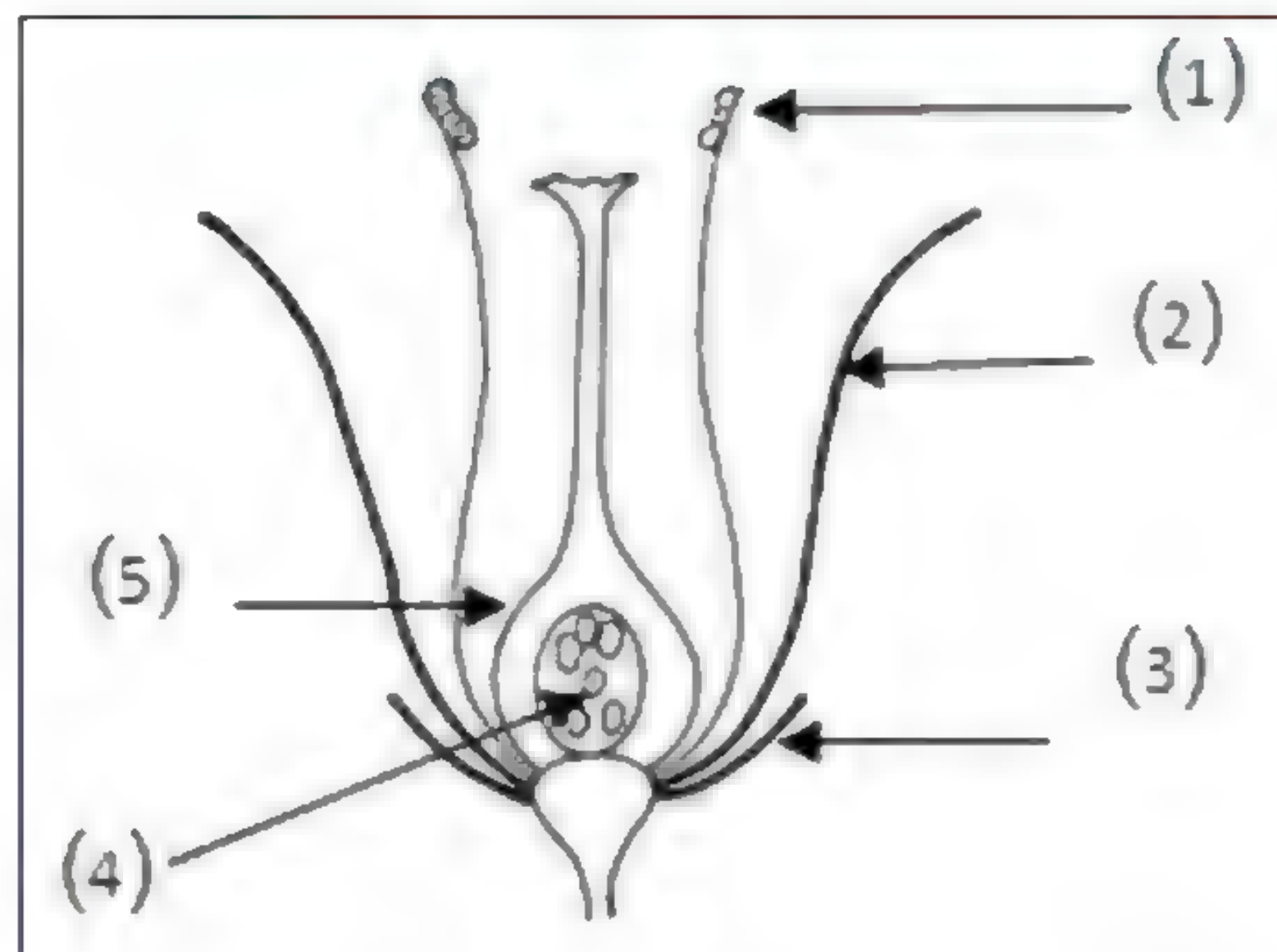
Questions

Unit (1)

(1) Write the scientific term:

1 It is a motion which is regularly repeated in equal periods of time.

2 It is the motion of oscillating body around its rest point, where the motion is repeated through equal intervals of time

3 It is the maximum displacement done by the oscillating body away from its original position

4 It is the motion of an oscillating body when it passes by a fixed point on its path two successive times in the same direction

5 It is the time taken by an oscillating body to make one complete oscillation

6 It is number of complete oscillations made by an oscillating body in one second

7 It is the disturbance that propagates and transfers energy in the direction of propagation

8 It is the motion produced as a result of the vibration of the medium particles at a certain moment and in a definite direction.

9 It is the direction through which the wave propogate.

10 It is a disturbance in which the particles of the medium vibrate perpendicular to the direction of wave propagation

11 It is the highest point of the particles of the medium in the transverse wave.

12 It is the lowest point of particles of the medium in the transverse wave

13 It is a disturbance in which the particles of medium vibrate along the direction of wave propagation.

14- It is the area at which the particles of the medium are of highest density and pressure.

15 It is the area at which the medium particles are of lowest density and pressure.

16 It is the distance between two successive crests or troughs.

17 It is the distance between the centers of two successive compressions or rarefactions

18 It is the maximum displacement achieved by the medium particles away from their rest positions

19 It is the distance covered by the wave in one second.

20 It is the number of waves produced from the source in one second.

21- Simplest form of oscillatory motion

(2) Give reason for:

1 The product of frequency and periodic time equals unity

2 The oscillatory motion is considered as a periodic motion.

3- Water waves are transverse waves.

4- Sound waves are longitudinal waves.

5 Sound waves are mechanical waves, while radio waves are electromagnetic waves

6 Hearing thunder after seeing lightning though they happen at the same time.

7 We can't hear the sound of solar explosions occurring on the sun, but we can see the light coming out of it.

(3) Compare between:

1) Mechanical waves and electromagnetic waves
2) Transverse and Longitudinal waves.
3) Oscillatory and wave motion

(4) Problems:

1 From the opposite figure of the oscillatory motion of a simple pendulum, calculate:

a) Amplitude
b) periodic time
c) frequency
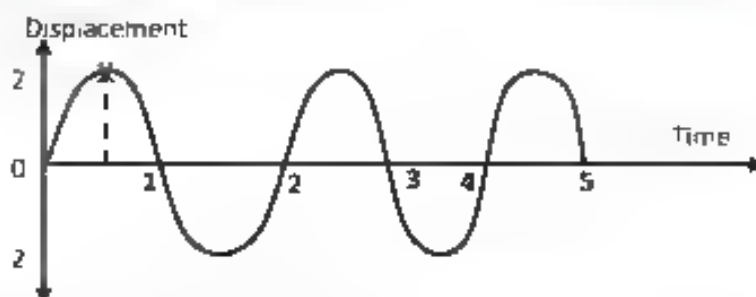
2 Calculate the periodic time and frequency for an oscillating body that makes 500 complete oscillations in two minutes.

3 Calculate the wave length in metre for a visible light wave of frequency 5×10^6 gigahertz and velocity of 3×10^8 m/s

4 A longitudinal wave is produced by a spiral spin such that the distance between the first and fourth compression is 24 cm find the wave velocity if the frequency of such wave is 20 kilo Hertz.

(5) What's meant by:

1 The time taken by spring to make 60 complete oscillations is 1 minute
2 The frequency of simple pendulum is 50 Hz
3 Wave length of sound wave is 30 cm.
4 Law of wave propagation
5 Amplitude of vibrating source is 5 cm
6 Wave length of transverse wave is 10 cm

(6) Calculate the wavelength in metre for a visible light wave of frequency 5×10^8 Megahertz, and velocity of 3×10^8 m/s

(7) Problems:

1) A longitudinal wave is produced by a spiral spring such that the distance between the first and the fourth rarefactions is 18 cm

Find the wave velocity if the frequency of such wave is 20 Hertz

2) From the opposite figure, calculate the velocity of the wave if its frequency is 25 Hertz

20 cm
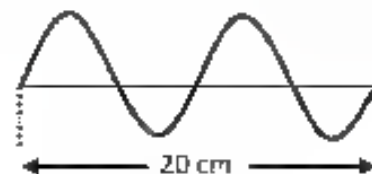
Important Laws:

1) Complete oscillation includes four amplitudes

2) Periodic time $= \dfrac{time\ in\ seconds}{number\ of\ complete\ oscillations\ made\ in\ that\ time}$

3) Frequency $= \dfrac{number\ of\ complete\ oscillations}{time\ in\ seconds}$

4) Frequency (f) $= \dfrac{1}{periodic\ time\ (t)}$

5) Frequency × periodic time = 1

6) Wave velocity (v) $= \dfrac{distance\ covered\ by\ the\ wave\ in\ metres\ (m)}{time\ in\ seconds\ (s)}$

7) Wave length $= \dfrac{total\ distance\ covered\ by\ waves}{number\ of\ waves}$

8) Wave velocity (v) = Frequency (f) × wave length (λ)

Important units:

1) Amplitude → metre (m), centimeter (cm)
2) Periodic time → second (sec.)
3) Frequency → Hertz (Hz)
4) Kilo Hertz = 10^3 Hz
   Mega Hertz = 10^6 Hz
   Giga Hertz = 10^9 Hz
5) Wave length → metre (m)
   Millimeter = 10^{-3} metre
6) Wave velocity → $\dfrac{metre}{second}$ m/sec

Important graphs:

1) Relation between frequency and periodic time
(inverse)
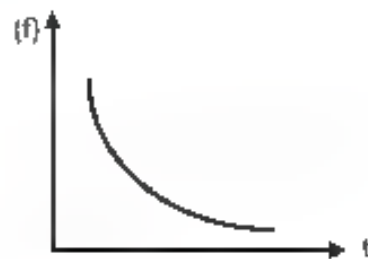
2) Relation between frequency and wave length
(inverse)
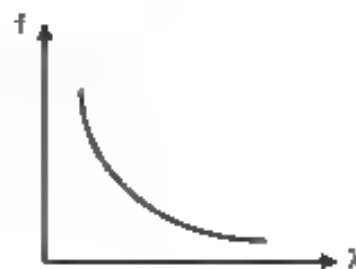
3) Relation between velocity (v) and frequency (f)
(direct)

4) Relation between velocity (v) and wave length (λ)
(Direct)

Unit (2)

Lesson 1, 2

(1) Write the scientific term:

1) It's the distance which is covered by the sound waves in one second.

2) It's a property by which the ear can distinguish between rough and sharp voices

3) It's the property by which the ear can distinguish between sounds either strong or weak.

4) The intensity of sound at a point varies inversely with the square of the distance between that point and the sound source

$$I \propto \frac{1}{d^2}$$

5) It's the property by which the human ear can distinguish between different sounds according to the nature of source even if they are equal in intensity and pitch

6) They are sound waves of frequencies ranging from 20 Hz to 20 KHz

7) They are sound waves of frequency less than 20 Hz.

8) They are sound waves of frequencies higher than (20 KHz)

9) They are tone that accompany the basic tone, but they are lower in intensity and higher in pitch and differ from one instrument to another

10) It is the return of sound waves in the same direction due to hitting a reflecting surface

11) The angle of incidence = the angle of reflection

12) The incident sound ray, the reflected sound ray and the perpendicular line from the point of incidence on the reflecting surface all lie on the same plane, perpendicular to the reflecting surface

13) It is the direction of the line of propagation of sound wave

14) It is the angle between the incident ray and the perpendicular to the reflecting surface at the point of incidence

15) It is the angle between the reflected sound ray and the perpendicular to the reflecting surface at the point of incidence.

16) It is a repetition of sound produced due to its reflection

17) It is the collection of sound at a point due to its reflection on a concave surface

(2) Give reason for:

1 We hear sound from all directions that surround the sound source.

2 Sound intensity increases when the sound source touches a resonance box.

3 Sound intensity in case of the presence of carbon dioxide gas as a medium is higher than that increase of air.

4 The human ear distinguishes between sounds from different sources even if they are equal in intensity and pitch.

5 The human ear can hear sounds of frequencies ranging from 20 to 20000 Hz.

6 Some sound waves can't be heard

7 Dogs can hear all sounds produced by man

8 Man can't hear sounds produced by dolphins

9 When a sound ray is incident perpendicular to a reflecting surface, it reflects on itself

10 Echo cannot be heard if the distance between the sound source and reflecting surface is less than 17 metres.

11 The voice of Imam can be heard clearly in all parts of large mosques without using microphones

12- Fennec fox has large ability of hearing.

13 The ultra sonic waves can be used in detecting the industrial defects

14- Bats can fly in the dark without colliding with any object.

15 A piece of moquette is put under the washing machine

16 The time period between hearing the original sound and its echo should not be less than $\frac{1}{10}$ of second

17 When you use Savart's wheel, you change the speed of wheel rotation

18 The infrasonic waves are used for weather forecast.

19 Ultrasonic waves are used to sterilize food and water

20 The ultrasonic waves have medical uses

(3) Complete the following:

1 The velocity of sound through air depends on   ,   .

2 Sounds can be classified into two groups which   ,   .

3 The voice of women is ..   .. ..pitched as it is . .   .   .

4- The voice of men is . ..   .   pitched as it is .. .., ...

5 As the sharpness of voice .   , the level of voice (pitch) gets   .   .   . . .

6- The sharp tones have .   ....frequency, while the harsh tones have .   .   , frequency

7 The frequency   .. by ...   ..the length of air column.

8- By increasing the ...., the frequency increase and the sound becomes ....

9- The measuring unit of sound intensity is ....

10- Noise intensity is measured in unit known as ....

11- By increasing the amplitude 3 times the intensity of sound increases ....

12- The string are fixed above an empty wooden box in guitar to ....

13- Sound intensity is .... proportional to the density of medium.

14- Types of sound waves .... and ....

15- Some animals such as ...., ... and .... can hear ultra sonic waves

16- The angle of .... = the angle of reflection

17- The human ear cannot distinguish between two successive sounds if the period between them is less than ....

18- From the applications of echo ...., ..., ..., ...

19- Sonar set is used to produce .... waves, while hydrophone set is used to .... the .... waves

(4) Problem:

1) Calculate the wave length of a sound wave propagating through sea water with velocity 1500 m/sec knowing that its frequency is 10 kilo hertz

2) Calculate the number of gear's teeth, if the wheel rotates with speed 180 cycles/minute and the frequency in Savart's wheel is 120 Hz

3) A person stood at a distance of 660 metres from a mountain and produced a sound. He heard the echo after 4 sec. calculate the velocity of sound at that time

4) A sailor produced a sound in sea, he heard its echo after 0.6 second. If the velocity of sound through water is 1435 m/sec. Calculate the depth of sea.

5) A person stood between two mountains and produced a sound. He heard two echoes after 2 and 3 seconds. If the velocity of sound through air is 340 m/sec find the distance between the two mountains

6) Find the number of rotations in 2 minutes made by Savart's wheel producing sound of frequency 300 Hz, if a metallic plate touches one gear of 100 teeth

Important laws:

1) Sound frequency $(f) = \dfrac{\text{number of cycles (d)}}{\text{time in seconds (t)}} \times$ number of gear's teeth (n)

   Savart's wheel is used to determine the frequency of an unknown tone.

2) Speed of rotation $= \dfrac{\text{number of rotation (turns)}}{\text{time (t)}}$

3) Inverse square law of sound

   $I \; \alpha \; \dfrac{1}{d^2}$

   I : intensity of sound

   D   distance between that point and the sound source

4) The velocity of sound (v) =

   $$\dfrac{\text{twice the distance between the source of sound and the reflecting surface}}{\text{the average time of echo in seconds}}$$

   $V = \dfrac{2d}{t}$

5) The depth of sea

   $\text{Depth} = \dfrac{\text{velocity of ultra sonic waves} \times \text{echo time}}{2}$

   $D = v \times \dfrac{t}{2}$

Important graphs:

1) The relation between intensity of sound and square distance

   Inverse square law of sound

   (Inverse relation)

   $$I \propto \frac{1}{d^2}$$

2) The relation between amplitude and intensity of sound

   (Direct relation)
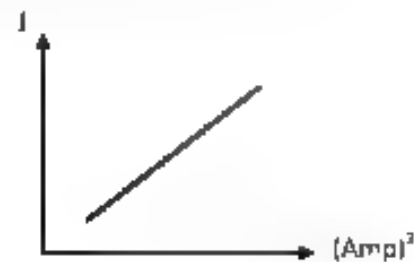
3) Sound intensity is **directly proportional** to the density of medium which travels sounds.

4) When sound ray is incident perpendicular to a reflecting surface, it reflects on itself because the angle of incidence = angle of reflection = zero

Unit (2)

Lesson (3, 4)

(1) Write the scientific term:

1) It's the distance covered by the light in one second

2) It's the one of the components of electromagnetic spectrum of wave length ranges between 380 – 700 nanometres.

3) It's the splitting of white light into seven colours called spectrum colours.

4) It's the quantity of light falling perpendicular to a unit area of surface in one second

5) The light intensity of surface is inversely proportional to the square of the distance between the surface and the source of light.

6) It's the returning back of light waves in the same medium on meeting reflecting surface

7) It's the reflection of rays when they meet (fall on) a smooth (uniform) and glistening reflecting surface, where the incident light rays are reflected in one direction

8) It's the reflection of light ray when they fall on a rough (non-uniform) reflecting surface, where the incident light rays are reflected in different directions.

9) It's a narrow beam which is represented by a straight line, it intersects with the reflecting surface at the point of incidence.

10) It is a narrow beam which is represented by a straight line that is reflected from the reflecting surface at point of incidence

11) It is the angle between the incident light ray and the line perpendicular to the reflecting surface at the point of incidence

12) It is the angle between the reflected light ray and the line perpendicular to the reflecting surface at the point of incidence.

13) It is the change of light path when it travels from a transparent medium to another transparent medium of different optical density

14) It is the ability of the transparent medium to refract the light.

15) It is the angle between the refracted light ray and the normal at the point of incidence on the interface.

16) It is the angle between the emergent light ray and the normal at the point of emergence on the interface

17) It is the ratio between the velocity of light through air to the velocity of light through another transparent medium

18) It is the angle of incidence of a light ray which travels from high optical dense medium to the lower one which results in it being refracted at 90° to the normal.

19) It is the return of light ray when it is incident in a medium of larger optical dense by an angle larger than the critical angle of this medium

20) It is a natural phenomenon that takes place on the desert roads at noon especially in the summer times where objects on the road sides seem as if they had inverted images on wet area.

(2) **Compare between:**

1) Transparent, translucent and opaque medium

2) Regular and Irregular reflection.

(3) Give reasons for:

1) Although water is a transparent medium we cannot see fish at the bottom of the river Nile

2) Book is an opaque medium.

3) The intensity of light increases four times when the distance between the light source and you decreases to its half value

4) The incident light ray which falls perpendicular on a reflecting surface, reflects on itself

5) The absolute refractive index of any transparent medium is always greater than one.

6) A pencil which is partially immersed in water appears as being broken

7) The sub merged object in water is seen in an apparent position slightly above its real position

8) To pick up a coin which has fallen in a deep beam we must look at it vertically

9) Light can travel through free space.

10) Formation of spectrum colors.

11) The energy of real light photon is less than that of orange light photon.

12) The energy of violet photon has the maximum energy in spectrum colours.

13) The optical density of a medium differs from a medium to another

14) When light ray travels from air to water it refracts near the normal

15) Sometimes, when light ray is incident in transparent medium, it refracts tangent to the separating surface

16) Occurrence of total internal reflection in a transparent

17) Occurrence of mirage phenomenon in desert regions at noon

(4) Mention used for:

1) Periscope   2) Optical fibers   3) Light

Important laws:

1) Energy of photon = planck's constant × frequency of photon

2) Absolute refractive index of medium = $\dfrac{velocity\ of\ light\ through\ air}{velocity\ of\ light\ through\ medium}$

Important drawing:

(1)

Regular reflection   Irregular reflection

(2) Reflection

Perpendicular to the reflecting surface

Angle of incidence   Angle of reflection

Reflection surface   Point of incidence
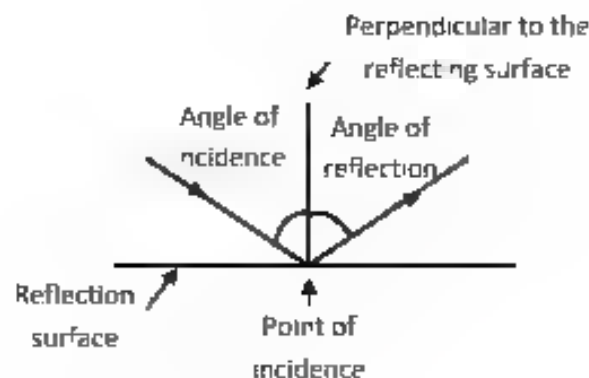
(3) Light ray travels from:

Medium (1) < medium (2)

Lower than

In optical density it refracts

- near the normal

- angle of incidence is > angle of refraction

a greater than

Angle of incidence

Air
low

Glass
high

Angle of reflection
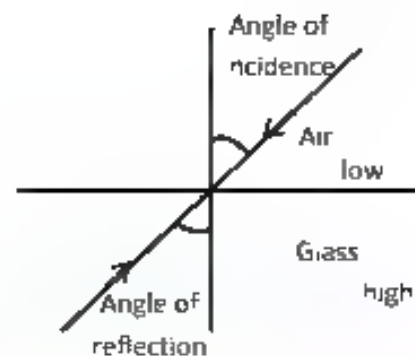
(4) Light travels from:

Medium (1) > medium (2) in
            greater than

optical density, it refracts far from the normal

→ angle of incidence is < angle of refraction
                                less than
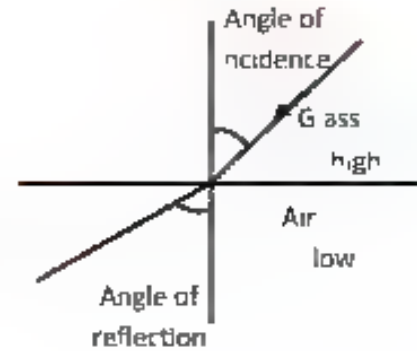
Note   glass > water > Air in optical density

(5) light ray fails perpendicular It pass the
    other medium without refraction

(6) Critical angle and total internal reflection Air

Important graphs:

(1)
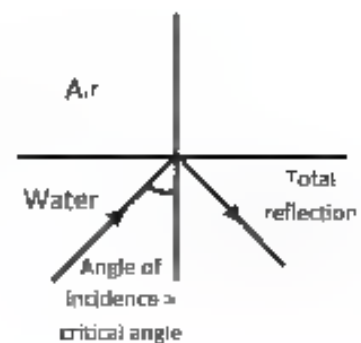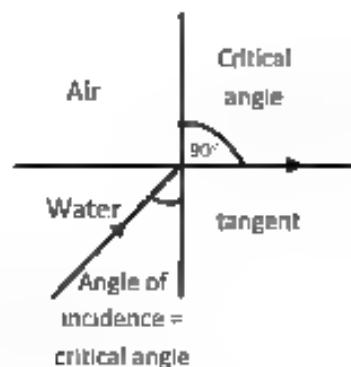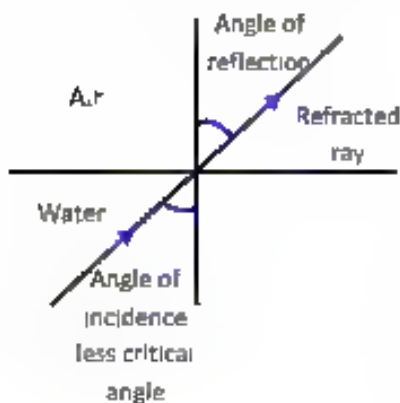
re ation between energy frequency of light wave

Directly

(2)

- inverse square

law of light

(3)
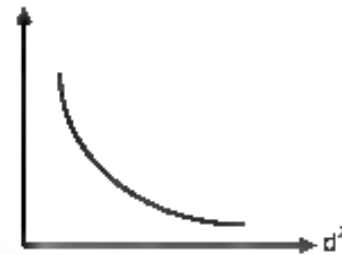
- Relation between angle of reflection &

ang e of incidence

(Direct)
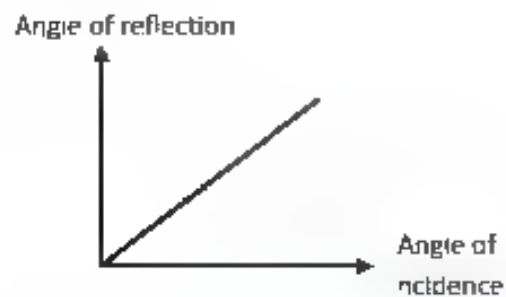
Unit (3)

(1) Write the scientific term for each of the following:

1 Short stem where the leaves developed and modified into reproductive organs.   (....................)

2 An organ in a flower that consists of an ovary, a style and stigma.
                                                   (....   .   .   )

3 The flower that contains both pistils and stamens. (.   .   .)

4 Small particles that spread in the air to fertilize the ovules in plants.
                                                   (. . .   )

5- A plant which is pollinated by man   (...   .   )

6 A plant structure that changes into a seed after fertilization process.
                                                   (.   . . .   )

7 New techniques the kind of seeds to obtain desirable traits.
                                                   (....   .   .   )

8 A group of green leaves in flowers, each of them is called a sepals
                                                   (....   .   .   )

9- The male reproductive organ in a flower.   (. . .   )

10- Fluid secreted by sexual glands.   (.   .   .   )

11- Funnel shaped tube lined with cilia.   (.   .   )

12 Female organ that pear shaped with thick elastic muscular walls
                                                   (.. . .   )

13 The time between infection of microbes and appearance of symptoms.   (.   .   .)

14- The cell formed due to combination of sperm and ovum.
                                                   (....   .   .   )

15- Male hormone secreted by testis.   (.   .. . .)

(2) Complete:

1. The flower arises from a floral . . . . . , which emerges from the axial of a leaf called . . . . . .

2. The corolla attracts .. . to the flower which helps in . . process

3. Each stamen consists a fine . . . . . ending in a sac known as the

4. Types of pollination are _____ pollination and _____ pollination

5. After fertilization, the ovary grows forming the . . while the ovule converts into the .. . .

6. Hermaphrodite flowers take the symbol . . , while male flower take the symbol . . . .

7. The cut is a part of _____ , stem or _____

8. The human male reproductive system consists of . . . ., two vas deferens ,................ and penis.

9. Each test is connected to a group of fine convoluted tubes known as _____ which extends in the form of single tube known as . .

10. The . . hormone in males and _____ hormone in female are responsible for the appearance of secondary sex characters

11. The menstrual cycle starts at age in female _____ and stops at the age of . _____

12. The two fallopian tubes are open in the _____ corners of the _____ . .

13. The sperm consists of ...., middle part and ....

14. The middle part of the sperm contains . . . responsible for energy production needed for the sperm.

15. _____ and _____ are examples of genital diseases which don't arise from sexual contact.

(3) Choose the correct answer:

1- The flower a modified ....
    a) stem   b) leaf   c) root   d) branch

2 The floral leaves of typical flower are arranged in whorls . . . .
    a) two   b) three   c) four   d) five

3 .... products pollen grains
    a) carpel   b) style   c) stamen   d) petal

4 In the flower, the organ which produces ovules is the . . .
    a) anther   b) receptacles   c) ovary   d) calyx

5 All of the following are unisexual flowers except
    a) tulip   b) palm   c) maiz   d) pumpkns

6 Sexual reproduction in plants take place in
    a) seeds   b) corolla   c) calyx   d) vegetative parts

7 Mixed pollination in plant trees is carried out by . . . .
    a) insects   b) seeds   c) air   d) water

8 After fertilization, the ovary develops forming the
    a) seed   b) flower   c) fruit   d) leaf

9 Grafting by attachment can be carried to the . . trees
    a) grape   b) sugarcane   c) rose   d) mango

10 Tissue culture is process of multiplying small parts of plant to get many
    . ... parts.
    a) different   b) similar   c) identical   d) small

11 All of the following are parts of male reproductive system except
    a) vas defense   b) uterus   c) testes   d) penis

12 The right ovary in the female human produces a mature (ripe) ovum
    every .... days
    a) 24   b) 28   c) 34   d) 56

13 .... hormone is responsible for the occurrence and continuity
    of pregnancy
    a) Estrogen   b) Testosteron c) Progesterone d) Thyroxin

14- The . . . is a muscular tube that expands during the labour

    a) uterus   b) vagina   c) ovary   d) fallopian tube

15- Chromosomes carry . . . which are responsible for the hereditary traits of the species

    a) rhibosomes   b) centrioles   c) genes   d) centrosome

16- The head of sperm secretes . . . to dissolve the cellular membrane of ovum.

    a) hormones   b) semen   c) fluids   d) enzymes

17- Fertilization occurs when ……………. is formed

    a) embryo   b) zygote   c) ovum   d) endometrum

18- The first stage of human embryo development takes . . weeks

    a) 5   b) 6   c) 7   d) 8

(4) Give reason for:

1- The petals of corolla are colorful and scented

2- The gynoecium is the female reproductive organ of the flower.

3- Palm flowers are unisexual.

4- Auto pollination can't happen in sunflowers.

5- The stigma of air pollinated flowers are feathery like and sticky.

6- Flowers pollinated by insects produce coarse pollen grains

7- Tissue culture is a good method for plant reproduction.

8- Man can't reproduce a sexually

9- The presence of testes outside the body in a sac-like structure called the scrotal sac

10- The seminal fluid is alkaline.

11- The uterus is suitable organ for growth the embryo.

12- The mother can feel the movement of her fetus starting from the third stage of fetus development.

Model Answers
Unit (1)

(1) Write the scientific term:

1- Periodic motion

2- Oscillatory motion

3- Amplitude

4- Complete oscillation

5- Periodic time

6- Frequency

7- Wave

8- Wave motion

9- Line of wave propagation

10- Transverse wave

11- Crest

12- Trough

13- Longitudinal wave

14- Compression

15- Rarefaction

16- Wave length (λ) of transverse wave

17- Wavelength of longitudinal wave

18- Amplitude of wave

19- Wave velocity

20- Wave frequency

21- Simple harmonic motion

(2) Give reason for:

1 Because the frequency is inversely proportional to the periodic time

where: $\qquad$ Frequency $= \dfrac{1}{periodic\ time}$

2 Because the motion of oscillating body is repeated through equal intervals of time

3 Because the water particles vibrate in a direction perpendicular to the direction of wave propagation

4- Because the medium (air) particles vibrate along the direction of waves propagation

5- Because sound wave need a medium to propagate and they don't propagate through vacuum while radio waves don't need medium to propagate

6- Because the light of lightning is from electromagnetic waves, while the sound of thunder is mechanical waves, where the speed of electromagnetic waves is much greater than the speed of mechanical waves

7- Because the sound is mechanical waves which need a medium to propagate through while the light is electromagnetic waves which can propagate through vacuum.

(3) Compare between:

1) Mechanical waves and electromagnetic waves

Mechanical	Electromagnetic
1- They need medium to propagate	2- They do not need medium to propagate.
2- They don't propagate through vacuum (free space)	2- They propagate through vacuum (free space)
3- They are transverse waves or longitudinal waves.	3- They are all transverse waves
4- Their speed is relatively low. Examples: sound waves (longitudinal) – water waves (transverse)	4- Their speed is great the speed of light = 3×10^8 m/sec Examples: light waves – radio waves (used in radars)

2) Transverse and Longitudinal waves

Point of comparison	transverse	Longitudinal
1 Definition	It is a disturbance in which the particles of medium vibrate perpendicular to the direction of wave propagation.	It is a disturbance in which the particles of medium vibrate along the direction of wave propagation
2 Composition	crests and troughs	compressions and rarefactions
3 Examples	water waves	Sound waves

3) Oscillatory and wave motion

Points of comparison	Oscillatory	Wave
1 Definition	it is the motion that is produced by oscillating body at the two sides of its original position	It is the motion produced as a result of the vibration of the medium particles at a certain moment and in a definite direction
2 Velocity	is maximum when the oscillating body passes its rest position. · is minimum when it goes far from its rest position	the wave has a definite velocity along the direction of propagation
3 Examples	Pendulum motion motion of spiral spring	sound waves as mechanical longitudinal wave · light waves as electro magnetic transverse waves

(4) Problems:

1   a) Amplitude (x) = 2 cm

   b) periodic time (t) = 2 seconds → time of oscillation

   c) frequency (f) = $\frac{1}{t}$ = $\frac{1}{2}$ = 0.5 Hz

2- T = 2 × 60 = 120 seconds

   Periodic time = $\frac{time\ (t)seconds}{No.of\ complete\ oscillations}$

   = $\frac{120}{500}$ = 0.24 seconds

   Frequency = $\frac{1}{t}$ = $\frac{1}{0.24}$ = 4Hz

3- Frequency = 5 × 10⁸ × 10⁹ = 5 × 10¹⁷ Hz

   Wave length (λ) $\frac{wave\ velocity\ ,v}{frequency\ ,f}$ = $\frac{3\times10^8}{5\times10^{17}}$ = 0.6 × 10⁻⁹ metre

4- 3 waves are formed between the first and fourth rarefactions

   ∴ 4 – 1 = 3

   ∴ Wave length (λ) = $\frac{24}{3}$ = 8 cm = 0.08 m

   Frequency (f) = 20 × 10³ Hz.

   Wave velocity (v) = wave length (λ) × wave frequency

   = 0.08 × 20 × 10³ = 1600 m/sec

(5) What's meant by:

1 The periodic time of spring is $\frac{60}{60} = 1$ sec.

2 Number of complete oscillation made by pendulum in one sec is 50 complete oscillations.

3 Distance between centers two successive comprssions or centers of 2 successive rarefactions is 30 cm.

4 Law of wave propagation

$$V = F \times \lambda$$

v . velocity of wave

F: frequency of wave

λ, wave length of wave

5 Maximum displacement achieved by medium particles away from their rest positions is 5 cm

6 Distance between two successive crests or two successive troughs in such wave is 10 cm

(6) Calculate the wavelength in metre for a visible light wave of frequency 5×10^8 Megahertz, and velocity of 3×10^8 m/s

Frequency $= 5 \times 10^8 \times 10^6 = 5 \times 10^{14}$ Hz

Wavelength (λ) $= \dfrac{\text{wave velocity (V)}}{\text{Frequency (F)}} = \dfrac{3 \times 10^8}{5 \times 10^8}$

$= 0.6 \times 10^{-6} = 6000 \times 10^{-10}$ metre

(7) Problems:

1) A longitudinal wave is produced by a spiral spring such that the
distance between the first and the fourth rarefactions is 18 cm
Find the wave velocity if the frequency of such wave is 20 Hertz

Solution:

3 waves are formed between the first and fourth rarefactions

Wavelength $(\lambda) = \frac{18}{3} = 6$ cm $= 0.6$ cm $= 0.06$ m

Wave velocity (V) – Wavelength (λ) × Wave frequency (F)

$= 0.06 × 20 = 1.2$ m.sec.

2) From the opposite figure, calculate the velocity of
the wave if its frequency is 25 Hertz.
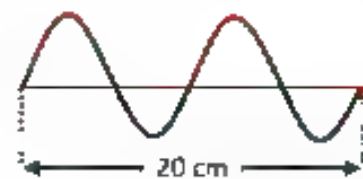
Solution:

20 cm

The figure shows two waves of length 20 cm

∴ The wavelength $(\lambda) = \frac{20}{2} = 10$ cm $= 0.1$ m

Wave velocity (V) – Wavelength (λ) × Wave frequency (F)

$= 0.1 × 25 = 2.5$ m.sec

Unit (2)

Lesson 1, 2

(1) Write the scientific term:

1) Sound velocity

2) Sound pitch

3) Sound intensity

4) Inverse square law of sound

5) Sound quality (type)

6) Sonic waves

7) Infra sonic waves

8) Ultrasonic waves

9) Harmonic tones

10) Sound reflection

11) First law of sound reflection

12) Second law of sound reflection

13) Sound ray

14) Angle of incidence of sound ray

15) Angle of reflection

16) Echo

17) Concentration of sound

(2) Give reason for:

1 Because the sound travels through air as pulses of compressions and rarefactions whose centre is the sound source

2 Due to the increase of the surface area of vibrating body

3 Because the density of carbon dioxide gas is more than that of air since the intensity of sound is directly proportional to density of medium

4 Due to the harmonic tones that associate the fundamental tone of the source of sound and are lower in intensity and higher in pitch

5 Because the ear transmits the effect of these waves to the brain which translates them into sound and audible tones

6. Because the frequencies of these waves are lower than 20 Hz or more than 20000 Hz, so the human ear cannot hear them as the effects of such waves cannot be translated by the brain into audible tones.

7. Because man produces sounds of frequencies less than 20 kilo Hertz and dogs can hear sounds up to 50 kilo Hertz.

8. Because dolphins produce sounds up to 120 kilo hertz, while man can hear sounds of frequencies up to 20 kilo hertz only.

9. Because the angle of incidence = the angle of reflection = zero.

10. Because the time between hearing the main sound and its echo will be less than $\frac{1}{10}$ of a second and the human ear cannot distinguish between the two successive sounds.

11. Because the surface of large mosques are concave which concentrate the reflected sound waves and make the sound more clear and more intense.

12. Because it has large and concave ear pinna that concentrate the reflected sound and make it more clear and more intense.

13. Because the waves reflected from the areas which contain air bubble have a different intensity than those reflected from well welded areas.

14. Because they produce ultra sonic waves that reflect on the surface and barriers then receive them back and locate their positions, thus the avoid colliding with them.

15. To absorb the noise produced due to vibration instead of its reflection from the glistening surfaces of walls.

16. Because the human ear cannot distinguish between two successive sounds if the period between them is less than 0.1 sec.

17. To change the frequency of the produced sound.

18 Because these waves accompany the blowing of storms that preceding rainfall

19 Because they have high abilty to k.l some types of bacteria and stop the action of some viruses

20 Because they are used for breaking down of kidney and ureter s stones and a so for diagnosis of male prostate tumors

(3) Complete the following:

1 temperature of air, air pressure , the humidity in air

2 musical tones, noise

3 high · sharp

4 low   rough

5 increase · higher

6 high · low

7 increases   decreasing

8 speed of rotation   high pitched (sharp).

9 watt /m^2

10 decibel

11 9 t mes

12 increase the sound intensity

13 directly

14 audible · non audible

15 bats, dogs - do ph ns

16 incidence

17 0 1 sec

18 determination of the velocity of sound through air, detecting industrial defects medica diagnos s, concentrat on of sound

19 ultrasonic   rece ve   reflected

(4) Problem:

1) Velocity (v) = frequency (f) × wave length (λ)

   Frequency = 10 kilo hertz = $10 × 10^3$ Hz

   ∴ wave length $= \frac{v}{f} = \frac{1500}{10^4} = 0.15$ m = 15 cm

2) F = 120 Hz

   Speed of rotation = 180 cycles /minute

   Time = 1 minute = 1 × 60

   Frequency (f) = $\frac{number\ of\ cycles\ (d)}{time\ in\ seconds}$ × number of gear's teeth (n)

   $120 = \frac{180}{1×60}$ × no of gear's teeth (n)

   ∴ Number of gear's teeth $= \frac{60×120}{180} = 40$ teeth

3) $v = \frac{2d}{t} = \frac{2×660}{4} = 330$ m/sec

4) $d = \frac{tv}{2} = \frac{0.6×1435}{2} = 430.5$ m

5) The distance between the person and the first mountain $\frac{v\ t_1}{2}$

   $= \frac{340×2}{2} = 340$ m

   the distance between the person and the second mountain $\frac{v\ t_2}{2}$

   $= \frac{340×3}{2} = 510$ m

   the distance between two mountains = 510 + 340 = 850 metres

6) Frequency $= \frac{No\ of\ rotations × no\ of\ gear's\ teeth}{time\ (in\ seconds)}$

   $300 = \frac{No\ of\ rotations × 100}{2 × 60}$

   No of rotations $= \frac{300×2×60}{100} = 360$ rotations

Unit (2) Lesson (3, 4)

(1) Write the scientific terms:

1) The speed of light

2) The visible light

3) Analysis of white light

4) Light intensity

5) The inverse square law of light

6) Light reflection

7) Regular (uniform) reflection

8) Irregular (non uniform) reflection

9) The incident light ray

10) The reflected light ray

11) Angle of incidence

12) Angle of reflection

13) Light refraction

14) Optical density of medium

15) The angle of refraction

16) The angle of emergence

17) Absolute refractive index of medium

18) Critical angle

19) Total internal reflection

20) Mirage

(2) Compare between:

1) Transparent, translucent and opaque medium.

Transparent medium	translucent medium	opaque medium.
- permits most light to pass through - objects can be seen clearly through it - Ex: Air – glass cup	- permits only a part of light to pass through and absorb the remaining part - objects can be seen through translucent medium less clearly than the transparent one. - Ex: tissue paper – flint glass	- doesn't permit light to pass through - objects can't be seen through opaque medium - Ex: foil paper – milk – wood - cartoon

2) Regular and Irregular reflection

Regular reflection	Irregular reflection
light fall on smooth surface incident light ray are reflected in one direction	light fall on rough surface incident light ray are reflected indifferent directions (scattring)

(3) Give reasons for:

1) Because the thickness of water at that point (bottom) is larger enough to prevent light to pass through

2) Because it doesn't permit light to pass through and objects can't be seen behind it.

3) Because is light intensity is inversely proportional to the square of the distance between them

4) Because the angle of incidence and the angle of reflection equal zero

5) Because the velocity of light through air is always greater than that through any other transparent medium

6) Due to the refraction of light rays coming from the immersed part in water

7) Due to the refraction of light rays coming from the object away from the normal where, the eye sees the extensions of these refracted rays

8) Because the incident light ray perpendicular to the interface between air and water it passes without refraction so the apparent position is the real position.

9) Because it is electromagnetic waves which do not need medium to travel through

10) Due to splitting of white light into seven spectrum colours

11) Because the frequency red light is less than that of orange light and the energy is directly proportional to the frequency

12, Because it has the maximum frequency in spectrum colors

13) Because velocity of light changes from one transparent medium to another

14) Because air is a transparent medium of lower optical density than water

15) Because the angle of incidence equals critical angle of the transparent medium

16, Because the angle of incidence is more than the critical angle of the medium

17) Due to occurrence of a several refractions then total internal reflections in the different air layers in density and temperature

(4) Mention used for:

1) Periscope:

a Used in submarines to see what is going on the water surface

b- To see events happening behind a wall

c to monitor the dangerous chemical reactions in laboratory

2) Optical fibers:

Used in medicine as they are used in manufacture of medical endoscopes used by doctors to diagnose some diseases and visualize injury inside the body

3) Light:

s used in home decorations like spot light to illuminate artifacts and stand lamps that concentrate light for reading

Unit (3)

(1) Write the scientific term for each of the following:

1. flower
2. gynoecium
3. B sexual flowe

4. pollen grains
5. palm trees
6. ovule

7. Tissue culture
8. calyx
9. Androecium

10. seminal fluid
11. fallopian tube
12. uterus

13. Incubation period
14. zygote
15. Testosterone

(2) Complete:

1. bud – bract
2. insects - pollination

3. filament – anther
4. self pollination – mixed pollination

5. fruit – seed
6. $♀ - ♂$

7. Root – leaf
8. two testes – genital glands

9. Epididymis – vas deferens
10. Testosterone – Estrogen

11. 11.14 – 45.55
12. upper – uterus

13. the head – the tail
14. mitochondria

15. Gonorrhea - syphilis

(3) Choose the correct answer:

1. leaf
2. four
3. stamen

4. ovary
5. tulip
6. seeds

7. insects
8. fruits
9. mango

10. identical
11. uterus
12. 28

13. progesterone
14. vagina
15. genes

16. enzymes
17. zygote
18. 6

(4) Give reason for:

1 To attract insects to make pollination.

2 Because it produces ovules which is the female reproductive cells

3 Because palm trees may be male trees or female trees

4 Because anther and stigma of sunflower plant never grow at the same time

5 To catch a large number of pollen grains to make pollination

6 To stick on the insect body to make pollination

7 Because it can produce a huge number of identical plants with good traits, and get many identical parts from a small part of the plant

8 Because the individuals coming from a sexual reproduction are identical to their parents, while the human, each individuals differ from others

9 To regulate and keep the temperature of testes two degree below the normal body temperature which is suitable temperature for the growth and development of sperms

10 To neutralize the acidity of urethra.

11 Because it has thick muscular wall that is rich in blood capilaries which feed the embryo and supply it with oxygen and it also protects the embryo until birth.

12 Due to the strength of the embryo muscles which help in movement

Science   2nd Prep.

Last Look

Second term

By:Mr.Mohamed Taha

1) Choose the correct ansewr:-

1 The production of mango occurs by (cutting   grafting   tissue culture)

2 The sound waves that accompany the blowing of storms are _____ waves
(Sonic – ultrasonic – infrasonic)

3 The conversion of sound at a point due to its reflection on a concave surface is called
(Echo – concentration of sound – sound velocity)

4- The measuring unit of sound intensity is (Watt/m²   Hertz   Decibel)

5- The human skin is considered a/an . . Medium.
(Transparent – opaque – translucent)

6 The right ovary in the human female produces a mature ovum every . days
(28 – 34- 56)

7 The human ear can distinguish between sounds of frequency .
(50 KHz – 300 Hz – 25 KHz)

8- Light waves are …. Waves
 (Mechanical transverse   electromagnetic longitudinal   electromagnetic transverse)

9 The typical flower consists of ___ floral whorls (4   3   5)

10- The quantum of energy of green light is _____ the quantum of energy of yellow light
(Greater than – equal to – less than)

11- The complete oscillation includes …. displacement/s (One – two – three – four)

12- The electric bell produces pluses of .
(Compressions and rarefactions   crests and compressions   troughs and rarefactions   crests and troughs)

13 The bones of embryo start to develop in the _____ stage of human embryo development
(First – second – third – fourth)

14- If the angle of incidence of a light ray is 60, so the angle of reflection equals
(30 – 60 – 120 – 15)

15 When the distance between the sound source and the ear is doubled, the sound intensity
   (Decreases to its half   increases twice   increases four times   decreases to its quarter)

2) Writ the scientific term :

1- It is the repetition of sound produced due to its reflection

2- Short stem where the leaves developed and modified into reproductive organs

3- The process of fusion of pollen grains with the ovum to form the zygote

4- The maximum displacement done by the oscillating body away from its original position

5- Sound waves of frequencies less than 20 Hz

6- It is an external factor which affects the eye causing the sense of vision

7- The time needed by an oscillating body to make a complete oscillation

8- A fundamental tone associated by other tones higher in the pitch and less in intensity

9- The amount of the light incident normally into a unit area of a surface in one second

10- A disturbance that propagates and transfers energy along the direction of propagation.

11- The return (recoil) of a light ray when it is incident in a medium of larger optical density by an angle larger than critical angle for this medium.

12- Two glands that produce the female cells in human females

13- The distance between two successive crests or troughs

14- Tones of uniform frequency and comfortable to be heard

15- The measuring unit of the noise intensity

16- The innermost whorl of a male flower

17- An oval shaped gland that produces male cells

18- The collection of sound at a point due to its reflection on a concave surface.

19- The reproduction of some plants by parts of the roots, stem or leaves.

20- A mixture of seven colors that form the white light.

21- The stage of embryo development which starts from the beginning of 25rd week till delivery.

22- A property of sound by which the ear can distinguish between weak and strong sounds.

23- Wave velocity = frequency × **wavelength**

24- They are small green leaves surrounding the flower from outside.

25- The flower that contains male and female reproductive organs.

26- It is the light wave from components of electromagnetic spectrum.

27- Angle of incidence = Angle of reflection

28- A new method to produce large numbers of plants from a small part of it.

29- A sac lies outside the male body and contains the testes.

30- A medium does not allow light rays to pass through it.

3) Compare between:

1- Longitudinal wave and transverse wave

2- Mechanical and electromagnetic waves

3- Self pollination and cross pollination

4- Sperm and ovum (with drawing)

5- Sonic waves and ultrasonic waves

6- Transparent, translucent and opaque media.

7- Puerperal sepsis and syphilis.

4) What are the conditions should be found to hear the echo?

5) Complete the following statements:

1- A complete oscillation comprises……………….successive displacements, each of which is called,………………

2- Sound intensity at a certain point is……………………proportional to the square of the distance between this point and the sound source, and is………………. proportional with the square of the amplitude.

3- When you look at a coin in a glass of water, it's…………………position appears to be lower than the ……………position.

4- Hermaphrodite flowers take the symbol…….while male flowers take the Symbol ……

5- The resonance box …………………….. the area of vibrating surface.

6- Mango trees reproduce by ……….. but sugar cane reproduce by ………………

7- The frequency of vibrating string is …………….. Proportional to its length.

8- ………….. of pendulum is directly proportional to its length.

9- From the examples of oscillatory motion is the …………………….

10- Jacuzzi is used to treat sprains and cramps by using …………….. water.

11- Sonar set produces …………… Waves whose frequency is more than …………...

12- ……………. , ………………… and ………….. Are components of sperm

13- ……………….. And ……………… are examples of genital diseases which don't arise from sexual contact

14- Radio waves are considered ……………….. waves that propagate through ……………. with velocity ……………………

15- Harmonic tones are lower in …………….. and higher in ……………………..

16- Before delivery, the embryo position changes gradually to be …………. Where the head is directed towards the ………………

6) Give reasons :

1- Ultrasonic waves are used for sterilization of food

2- Olive fruit contains one seed

3- We must not use metallic cooking pots in the microwave

4- Auto pollination can't happen in sunflower

5- Oscillatory notion is considered as a periodic motion

6- The energy of red light photon is less than that of orange light photon

7- Sound can be heard from all surrounding directions.

8- The difference in frequency between the musical note and noise.

9- The absolute refractive index for any transparent medium is larger than 1.

10- A new mother should avoid air currents after delivery.

11- We see lightning before hearing thunder.

12- If a sound ray is incident perpendicular to a reflecting surface, it reflects on itself.

13- The product of frequency and periodic time equals one.

14- Bats can determine the position of their preys.

15- Pea fruit contains more than one seed.

16- Fallopian tube is lined with cilia.

17- The uterus is a suitable organ for the growth of embryo.

18- The sound can be heard from all direction.

7) Mention the function of :

1- Sonar set   2- Savart's wheel   3- The mid piece of a sperm   4- Optical fibers
5- Ultrasonic waves   6- Scrotal sac   7- Testosterone hormone   8- Fallopian tube
9- Jacuzzi (physiotherapy tubes)   10- Radio waves   11- Corolla   12- Two testes
13- Triangular glass prism   14- Seminal fluid   15- Two ovaries
16- The vas deferens   17- Estrogen and progesterone hormones

8) Problems :

1- Calculate the periodic time for an oscillatory body that makes 600 complete oscillations in one minute.

2- Savart's wheel rotates with 300 cycles per minute. A sound of frequency 600 Hz is produced when an elastic plate touches the teeth of the gear. Calculate the number of the teeth of the gear.

3- A person stood at a distance of 680 meters from a mountain and produced a sound, he heard the echo after 4 sec. Calculate the velocity of sound at that time.

4- An ultrasonic wave is produced by a ship. The wave hit the seabed and returned back after 0.1 of second. Calculate the depth of sea, given that the velocity of such wave through water is 1490 m/sec.

5- Calculate the wavelength of a sound wave propagates in sea water with velocity 1500 m/sec, knowing that the frequency of the wave is 10 kilo Hertz.
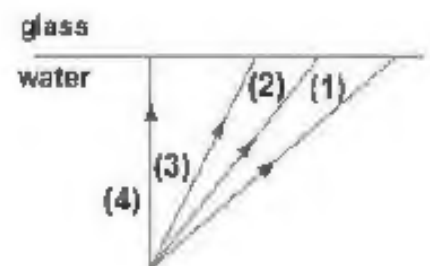
6- Calculate the absolute refractive index of diamond given that the speed of light in it $=1.25 \times 108$ m/s.

7- From the opposite figure. find:

   (a) Wavelength.   (b) Frequency.

   (c) Amplitude.   (d) Wave velocity.
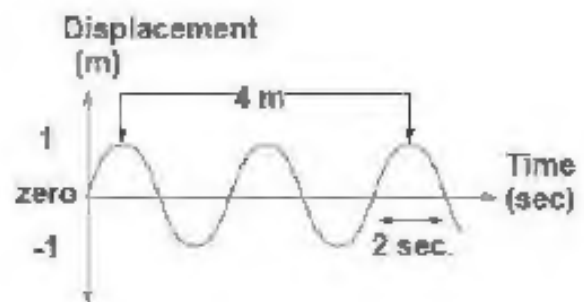
8- Complete the path of the light rays illustrated in the opposite figure given that the angle of incidence of the light ray (2) equal the critical angle.
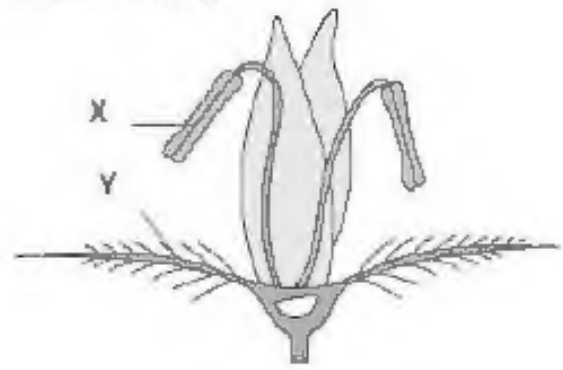
9- The opposite figure shows a flower being pollinated by wind (air):

(a) Write the labels for each of x and y.

(b) Mention two characteristics that make this flower pollinated by wind (air).

(c) Explain how cross pollination happens in this flower.

10- Study the following figure which represents the female genital system, then answer the following questions:
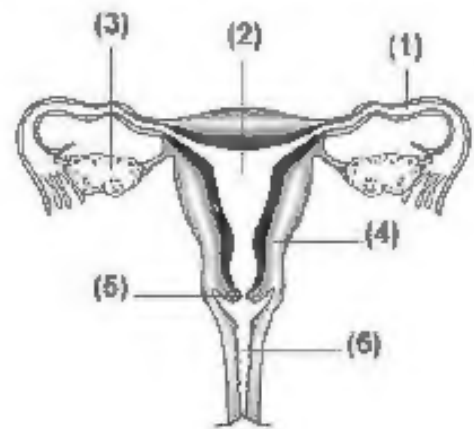
(a) Replace the numbers present on the figure by the suitable labels.

(b) What's the organ in which:

(i) Ova are produced.

(ii) The ovum is fertilized.

(iii) The embryo is delivered to life.

11- Choose from the column (b) and (c), what's suitable for column (a):

(a)	(b)	(c)
Floral whorl	**Consists of**	**Function**
1. Calyx	1. Stamen	1. Male organ in a flower.
2. Corolla	2. Sepals	2. Female organ in a flower.
3. Androecium	3. Crapels	3. Protects the inner parts of a flower.
4. Gynoecium	4. Petals	4. Attract insects to the colored leaves.

Wishing you all good luck
Mr. Mohamed